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FROM time immemorial medical men have sought to alleviate the pains of childbirth either by expediting the delivery of the child, and so curtailing the time during which pain is felt, or by the administration of sedative, hypnotic, anæsthetic, and analgesic drugs. The former method has been in general use since the secret of the Chamberlen family was discovered. The obstetric forceps was kept a close secret by four successive generations of Chamberlens. More recently attempts have been made to shorten labour by means of oxytocic drugs, such as pituitrin and its derivatives. The exhibition of such drugs to women in labour is always dangerous and rarely successful, unless the head is on the perineum. I am not referring to their use in small doses, and in conjunction with other drugs and with other means, for the induction of labour. McIlroy advises against the use of pituitary extract, whatever the conditions are, before the end of the third stage of labour.

During our lifetime the efforts of the profession have been chiefly directed towards the alleviation of the pains by the sedative, anæsthetic, hypnotic, narcotic, and analgesic drugs. In reviewing a few of the methods, of which the number is legion, at our disposal to-day it is worth remembering that the ideal one has not yet been discovered. The ideal is, without risk to the mother or her future child, to abolish pain throughout labour. Since midwives are annually responsible for more than 60 per cent. of the confinements in Great Britain it is evident that they will have to be allowed to use the ideal method, when it is found, if the pains of labour are to be abolished in all women, or in a majority of women. Fairbairn has pointed out that an Act of Parliament would be required before midwives could be permitted to administer the anæsthetic drugs, unless ordered to do so by a qualified medical practitioner. The ideal method has not yet been discovered. When it is, and I hope not before, a Bill will no doubt be presented to Parliament to legalise the administration of anæsthetic drugs by the midwife. Until then she must, rightly or wrongly, confine herself to the use of such drugs as potassium bromide, chloral hydrate, and opium, so far as the alleviation of pain is concerned.

We must, therefore, relegate the ideal to the future and discuss the practical methods at our disposal. Under the existing conditions of obstetric practice it is necessary that the method of alleviating pain shall, most importantly, neither alter the normal mechanism of labour nor in any way increase the risk to the mother or child; it must minimise pain throughout labour, so far as is possible under existing conditions: and it must not be unduly costly to the patient. The first of these desiderata is axiomatic, the second is demanded by the patient and the third by both the poor patient and the grossly underpaid medical practitioner.

Although the ideal of a completely painless safe labour cannot be guaranteed to the patient, we can, by the skilful and judicious use of drugs, diminish her sufferings and, without danger to her or her future child, save her some of the agony endured by the mothers of former generations. Maybe the laity has had some effect in directing the attention of the profession in general, and of the obstetric specialty in particular, to the fear and loathing with which modern woman, not surprisingly, regards the pains of labour. Certainly the laity has, through the agency of funds collected by Mrs. Baldwin, Lady Balfour of Burleigh, and others, made it possible for the poor woman, if she chooses to be confined in a hospital which has accepted a grant from the committee, to be relieved of pain in a similar way to the rich. The popular agitation, like all popular movements, is not without reason; but, like all popular movements, it is unreasoned. Our patients are asking for something which it is not in our power to give.

Our duty is, surely, to avoid rashness and excess in either direction, neither promising a painless confinement on the one hand, nor condemning the patient to the tortures of the damned on the other. The former is unsafe and the latter unnecessary. The drug, or drugs, employed should be chosen to meet the requirements of the case, within the limits of safety. The routine use of one method, or one drug, shows a lack of knowledge and may cause the death of the mother or child. Besides, it spells mediocrity. It would be absurd to allow a highly neurotic woman to pass unrelieved through a prolonged first stage because this or that form of anæsthesia is to be used in the second. It would be ridiculous to produce amnesia during an almost painless, or short, first stage in a mentally well-balanced or plethoric individual. The method chosen must be the most suitable one for the patient.

The Sedative Drugs

The sedative drugs commonly employed in obstetric practice are four in number: potassium bromide, chloral hydrate, morphia, and hyoscine. They act on the brain, and the object in administering them is to secure rest, by abolishing the sensation of pain for a woman who is worn out by the undue prolongation of labour or by short, useless pains, and by soothing a hypersensitive, neurotic, or mentally unstable woman. Their exhibition is most frequently indicated during the first stage of labour in cases of disordered uterine action due to anomalies of the forces, and in cases in which labour is delayed from mechanical causes. The anomalies of the forces are sluggish uterus, exhausted uterus, spasmodic rigidity of the cervix and reflex nervous inhibition of the uterus; the mechanical causes are disproportion and malpresentation. Two or more of these abnormalities are frequently present at the same time in the cases which commonly cause great anxiety. The woman with a minor degree of pelvic contraction, whose child presents with the occiput posterior, whose membranes rupture early, whose uterus is sluggish and cervix slow to dilate, is well known as one of our most difficult problems, which is made more difficult by the relatives when the woman is being confined in her home. In such cases one of the sedative drugs, or a combination of the sedative drugs, is indicated.

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* A lecture to post-graduates at the Middlesex Hospital.

is made more effective by the addition of tincture of opium or by giving large doses of chloral hydrate, as practised by Eardley Holland. When given without morphia or opium, these drugs are frequently without effect, although they are occasionally useful as a placebo to the patient and her relatives.

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Morphia, or its parent, opium, is the most useful of the sedative drugs. Fairbairn has extolled its use. Its benefit is twofold. The central analgesic action is well known, while Bourne and Burn have shown that it has a local action, which is probably produced centrally, upon the uterine contractions, which are lessened in frequency, but increased in duration, after its hypodermic injection. A large number of short contractions is replaced by a smaller number of long ones; the former are of much less use than the latter in dilating the cervix. Moreover, this effect is produced without increasing the pain felt by the patient during each contraction; indeed, the pain caused by the long, slow contractions induced by morphia is, owing to the analgesic action of the drug, less than that caused by the previous short contractions.

The best results are obtained when it is given early. Fairbairn says that it should be given to the patient "when she is tiring, and before she is tired." It should always be given early in cases in which an unduly long labour is anticipated, on account of disproportion or malpresentation; when the patient is unduly nervous, hypersensitive, fearful or neurotic; and when the patient, often highly strung and nearly always fearful, is rapidly tired by short, ineffectual contractions. The first injection, of gr. $\frac{1}{6}$ to $\frac{1}{4}$, should be given as soon as the patient exhibits the signs of mental fatigue. It is often unnecessary to give a second dose.

When the patient is unusually hypersensitive and apprehensive it may be advisable to combine morphia with hyoscine, although morphia alone is often efficacious. It should always be given to patients who are first seen after labour has been in progress for many hours, before attempts at artificial delivery are made, unless the obstetric contra-indication to its administration is present. In many cases, if not in most cases, spontaneous delivery occurs after the rest induced by an adequate injection of morphia.

The inestimable value of morphia in cases of eclampsia is well known. It is almost unnecessary to say that morphia, on account of its narcotic effect upon the respiratory centre of the child, should never be exhibited to a patient when her delivery is expected to occur within three hours, or a lesser period of time.

MORPHIA AND HYOSCINE

The literature on the combined use of morphia and hyoscine during labour is very extensive and exhaustive, if not exhausting. A continuous series of papers has appeared on the subject, from Steinbüchel's paper, published in 1902, on "A method of inducing amnesia during labour by the hypodermic injection of scopolamine hydrobromate and morphine," until the publication of Claye's papers, in 1931 and 1932, in which he describes his method of using hyoscine hydrobromide. The most illuminating reviews on the subject are those of Lequeux, Siegel, and the committee of the obstetric section of the Royal Society of Medicine. The gravest disadvantage of this method is an undoubted suppression of the normal uterine function which results in a prolongation of labour and an increased incidence of forceps-delivery; amnesia can be guaranteed only in three-quarters of the cases. In spite of this it cannot be denied that the method possesses certain advantages; it is the treatment of election for reflex nervous inhibition of the uterus. But it is unsuitable for ordinary domiciliary midwifery; first, because it depends for its success upon the fulfilment of conditions which cannot be realised unless the patient is under the constant care of a specially trained personnel; secondly, because the relatives and friends of the patient become alarmed at her restlessness and excitement, which occur in many of the cases; and thirdly, because of the demand made upon the time of the obstetrician, who must be in almost continuous attendance throughout the labour, which usually lasts for 24 hours or more.

The Anæsthetic Drugs

There is universal agreement among practitioners that the acute pain which is experienced by the parturient woman towards the end of the second stage of labour should be relieved by one of the anæsthetic drugs, used as analgesics. Chloroform is, justly, the most popular; ether and a mixture of chloroform and ether are the alternatives.

Unfortunately the uterine contractions are diminished in strength and frequency by the inhalation of either of these anæsthetics. Dönhoff, Hensen, and Bourne and Burn have proved this beyond all doubt; clinical experience in the labour ward confirms their observations. Practically, however, the diminution in the strength of the contractions is not so great as seriously to delay delivery in the large majority of cases, provided the patient is only lightly anæsthetised.

Either chloroform or ether or a combination of chloroform and ether can, in small doses, be administered with safety towards the end of labour. Most obstetricians prefer chloroform to ether, although the reasons for this preference are seldom stated in text-books and papers on the subject. I think that chloroform is the more generally useful, for: (1) it is easier to induce analgesia with chloroform than with ether because the former acts more rapidly than the latter, particularly if the midwife is administering the anæsthetic under the direction of the practitioner; (2) analgesia can more rapidly and more surely be converted into anæsthesia, at the appropriate time, by chloroform than by ether; (3) ether causes an excessive and troublesome secretion of mucus in the trachea and bronchi; and (4) vomiting, as Charles has observed, is usually more pronounced after ether than after chloroform.

The administration of chloroform, ether or a combination of the two should not be begun until the head can be felt through the perineum, and the chosen drug, or chosen mixture, should only be given to the woman during the pains until the head is imminently to be born, when surgical anæsthesia is required. Between the pains the mask should be removed from the woman's face, to be reapplied when she begins to feel the next pain. The time at which analgesia is induced is of the utmost importance. Chloroform and ether admittedly interfere with the normal mechanism of parturition. Their too early exhibition may result in delivery by the forceps, which could have been avoided, while undue procrastination in their exhibition may mar their effect. Experience dictates the best time to begin the administration of these drugs in an individual case; but, when there is a doubt, it is safer to wait. It is difficult, if not impossible, to

discontinue analgesia, the patient quite naturally resenting its cessation.

The danger of prolonged and deep chloroform anæsthesia is well known. The production of analgesia, by the discontinuous administration of the drug, requires from two to four drachms of chloroform. The quantity used should always be approximately estimated and more than six drachms of chloroform should not be given. When surgical anæsthesia is required for the obstetric operations, including the application of the forceps, either ether or a mixture of chloroform and ether should be used.

CHLOROFORM

Chloroform may be administered on a mask by the midwife, acting on the instruction of the obstetrician, or by an anæsthetist, acting in collaboration with the obstetrician. Or it may be given by Junker's inhaler worked by the patient herself. We have used Junker's inhaler for more than ten years in the labour ward at Middlesex Hospital, and the patients have been satisfied. It is the safest of all anæsthetics; for, so soon as the patient's volition departs, she cannot obtain any more anæsthetic.

It may be given by the obstetrician or by the midwife, acting on the obstetrician's orders, in ampoules. This method has been tried, and is being tried, at Middlesex Hospital and at Queen Charlotte's Hospital. Rivett strongly advocates it, affirming that it could be safely given by a midwife on her own initiative. Each ampoule contains 20 minims of chloroform. An ampoule is broken by the midwife on to a mask of lint and applied to the face of the patient when the head begins to show. A second ampoule is broken when the effect of the first begins to wear off, usually after one to three pains. About six to ten ampoules are used in an ordinary case. The midwife should be instructed not to give more than one ampoule during five minutes. This method would probably be the safest and most convenient method for midwives to use if they were allowed to give chloroform in cases in which they are not acting under medical instructions.

Chloroform, of all the drugs used for the assuaging the pains of labour, is the most satisfactory under the prevalent conditions of ordinary domiciliary midwifery, but again I insist that a limit must be set upon the quantity used, and the degree of anæsthesia must be shallow.

USES OF ETHER

Ether or *a mixture of chloroform and ether* can be given on a mask in the same way as chloroform, with minor differences—such as the thickness of the material of the mask—in technique. My preference is for chloroform, unless deep anæsthesia is required.

Ether and magnesium sulphate.—Another method of giving ether was introduced by Gwathmey in 1924. He has used it in more than 20,000 cases. It depends upon the induction of hypnosis, with subsequent amnesia, by the administration of drugs whose actions are complementary. The treatment is begun when the cervix is completely taken up and the uterine contractions are good.

After an enema saponis at the beginning of treatment a subcutaneous injection of gr. ¼ of morphine sulphate and 2 c.cm. of a 50 per cent. solution of magnesium sulphate is given. After an interval of 20 minutes the magnesium sulphate is repeated without morphia. The morphia is given for its sedative action, which is prolonged and increased by the concomitant and succeeding injections of magnesium sulphate.

When the sedative action begins to wear off, an alcoholic and oily solution of ether and quinine is given by the rectum. The formula for this solution is: quinine alkaloid, grs. xx.; alcohol, ♏ xl.; ether, ℥ iiss.; olive oil, ad. ℥ iv. Immediately after the enema a third injection of 2 c.cm. of magnesium sulphate is given. Thereafter the patients sleep between the pains for a period of two to four hours, when complete consciousness begins to return. Another enema, containing grs. 10 of quinine, is then given. If necessary, a third enema containing grs. 10 of quinine is given. The depressant effect exerted by the morphia and ether on the uterine contractions is thought to be counteracted by the simultaneous exhibition of quinine.

Gwathmey, Davis and Harrar, and the other protagonists of this method claim success in 85 to 97 per cent. of the cases without danger to the mother or child. Labour, they say, is not prolonged, the forceps rate is not increased, and post-partum hæmorrhage is lessened. The method has been conspicuously unsuccessful in the few cases in which we have tried it at Middlesex Hospital. The method possesses the disadvantage of a somewhat complicated technique which necessarily entails frequent and repeated visits by the practitioner. For this reason it is unsuitable in private practice, while in hospitals it is difficult to secure the isolation and quietude which are essential to its success. It has been alleged that proctitis sometimes occurs, although this is denied by all authors with a wide experience.

NITROUS OXIDE AND OXYGEN

I have no hesitation in affirming that the best method of relieving the pains, without sacrificing eutocia, when repeated and prolonged attendance by the obstetrician is possible, when the services of more than one nurse are available if required, and when an anæsthetist, as well as an obstetrician, is in attendance, is by gas-and-oxygen. It is well known that this anæsthetic never affects the uterine contractions; it can be given for a long period without the risk of harming the mother or the child; it is a certain means of producing anæsthesia; the degree of anæsthesia can be rapidly altered, when necessary; and it does not have any unpleasant after-effects. We have given gas-and-oxygen, by Boyle's apparatus, with uniformly successful results in the labour ward of the Middlesex Hospital.

It is not usually necessary to begin the administration of gas-and-oxygen until the end of the first stage of labour, although it is not contra-indicated earlier. Lynch, who in 1915 was responsible for the introduction of this method of anæsthesia into obstetric practice, favours its commencement early in the first stage. A timely injection of morphia, or of morphia and scopolamine, during the first stage makes the use of gas-and-oxygen unnecessary before the cervix is fully dilated. The mask is applied to the patient's face at the onset of each contraction and removed between the contractions. During the delivery of the head the anæsthesia should be deepened by the addition of ether. The woman must never be allowed to become cyanosed. If she is, the baby will probably be born with blue asphyxia. A high degree of skill is necessary consistently to avoid cyanosis.

Although pre-eminently safe and sure, nitrous oxide and oxygen require for their proper administration the services of one highly skilled in their use; they are expensive, and the apparatus is heavy and cumbersome. The resulting cost of the method restricts its use to hospitals and patients of affluence.

The Hypnotic Drugs

During the past decade various derivatives of barbitonum have been introduced. The best known are avertin, sodium amytal, nembutal, and pernocton. Extravagant claims have been made for each of these drugs; but their number and the numerous methods

recommended by different authors for their administration strongly suggests to me that none of them is absolutely reliable if given in safe doses. Nembutal, given orally with chloral hydrate as recommended by O'Sullivan and Craner, is probably the most satisfactory; sodium amytal appears to be the least desirable. They are all given for their hypnotic effect, in the hope that when consciousness is regained, after the artificially induced sleep, the woman will be amnesic regarding the pains of labour after the induction of hypnosis. The published reports clearly indicate that each of the four drugs is successful in a majority of the cases in which it has been used, but they all possess certain inherent disadvantages. First, the patient may become very excited, even maniacal, while under the influence of any of them. This demands a greater number of attendants than are ordinarily present at a confinement. The excitement appears to be greater with sodium amytal than with any of the other three drugs; but, I must admit, I have never used sodium amytal. My experience of avertin, pernocton, and nembutal is that excitement does sometimes occur; the patients must, therefore, be carefully watched. Secondly, it is impossible accurately to gauge the dose. It may be known that x mg. or y c.cm. per kg. of body-weight is a safe and effective dose in a majority of cases, but idiosyncrasy is not uncommon. On the one hand, the recommended dose may be without effect, while, on the other hand, it may cause collapse. Thirdly, and in spite of assertions to the contrary, my experience leads me to believe that the barbiturates interfere with the natural course of labour, which is prolonged by their use and has, more frequently than usual, to be terminated by the forceps. Fourthly, the correct treatment of overdosage is not known. Fifthly, and less importantly, one of the anæsthetic drugs is almost always required to supplement the hypnotic drug during delivery.

These disadvantages limit the use of the barbiturates. They should only be used in hospitals, well-conducted nursing-homes, and in private houses in which an adequate number of assistants can be employed. In these circumstances it seems unwise to replace morphia, judiciously exhibited during the first stage of labour, and gas-and-oxygen skilfully administered during the second stage, by hypnotic drugs of uncertain and possibly dangerous action.

NEMBUTAL

Nembutal, sodium-ethyl-methyl-butyl barbiturate, is one of the latest of the barbiturates to be introduced into obstetric practice. This drug undergoes decomposition by hydrolysis if kept in contact with the air. The manufactured product is, therefore, sold in capsules covered with a coat of gelatin; each ampoule contains grs. 1½ of nembutal. O'Sullivan and Craner have described, in a well-balanced and unbiased paper, their method of giving nembutal with chloral hydrate. The chloral hydrate is given in three ounces of freshly prepared lemonade with sugar ten minutes after the capsules containing the nembutal have been swallowed. If the chloral hydrate is given immediately after the nembutal, or if the quantity of fluid in which the chloral hydrate is dissolved is too bulky, the patient vomits. Both drugs are given by the mouth. The first dose, consisting of grs. 3 of nembutal (two capsules) and grs. 30 of chloral hydrate, is given to primiparæ when the cervix is two-fifths to three-fifths dilated and to multiparæ when it is one-fifth to two-fifths dilated, regular uterine contractions being present.

The time of administration of the drugs is important because the uterine contractions are diminished in strength and frequency if they are given too soon, and they do not have time to act if given too late. Failures occurred in cases in which they were given less than an hour and a half before delivery. The second dose, consisting of the same quantity of each drug, should be given about two hours after the first; subsequent doses should be given at intervals of three hours: the total dosage should not exceed grs. 7½ of nembutal and grs. 120 of chloral hydrate. O'Sullivan and Craner are satisfied that their method is safe and reliable. Indeed, they are of the opinion that nembutal and chloral hydrate could be given by midwives without danger, if the midwives followed their technique without any variation. Their results are, undoubtedly, encouraging: labour was painless in 62 per cent. of their cases, varying degrees of amnesia were achieved in their other cases, but in 7 per cent. the method failed.

PERNOCTON

Pernocton is the latest derivative of barbituric acid to be introduced into obstetric practice. It is composed of a 10 per cent. solution of the sodium salt of secondary butyl-β-bromalbyl barbituric acid. Bumm brought pernocton into prominence in 1926 and 1927, when he published the results of the anæsthetic use of the drug for gynæcological operations and of his experiments with it on dogs. Bumm's research was due to his dissatisfaction with somnifen, pernocton's barbituric predecessor. He found evidence of renal and hepatic damage in three cases after using somnifen; he says that that drug produces undue excitement and that the post-operative sleep is unduly prolonged. On the other hand he found that pernocton does not possess these three disadvantages. He found that the minimum lethal dose of pernocton was ten times greater than the minimal effective dose: when it was given to dogs in lethal doses death was due to paralysis of the respiratory centre. Pernocton produces amnesia by its action on the brain. It is not split into toxic substances after its introduction into the body; after its reduction to acetonyl barbituric acid, it undergoes further reduction into inert substances which are not toxic.

It can be given either intravenously or intramuscularly. It must not be given subcutaneously, because the skin sloughs over the site of the injection.

The injection should be made very slowly when the intravenous route is chosen, in order that the concentration of pernocton in the blood shall not be raised too quickly; the overlying skin will slough if any of the solution is injected outside the vein. The injection of an ampoule containing 2·2 c.cm. should not occupy less than two and a half minutes. It should, therefore, take five minutes to inject the contents of two ampoules. Matters states that the intravenous route is the better because it permits the correct rate of absorption by the nerve-cells and ensures accurate dosage; other authorities agree.

The solution is sold in ampoules containing 2·2 c.cm. of the 10 per cent. solution. Goldschmidt gives 1 c.cm. of pernocton for each 12·5 kg. (27·5 lb.) of body-weight; Goetz, 1 c.cm. for each 10 kg. (22·2 lb.) of body-weight; Matters, 1 c.cm. for each 12 kg. (26·4 lb.) to 15 kg. (33·1 lb.) of body-weight.

A woman weighing 112 lb. (8 st.) would, therefore, be given 4·3 c.cm. of the solution by Goldschmidt, slightly more than 5 c.cm. by Goetz, and from 3·4 to 4·2 c.cm. by Matters.

The other authors whose papers I have read are not so precise in estimating the correct dose. Hole recommends a dose of 4·4 to 7·5 c.cm., the dose depending on the weight of the patient. Brown, Moloy, and Laird prescribe a dose of 4·4 c.cm. as the initial dose for patients of average weight. If a second dose is required, they usually give 2·2 c.cm., but they have frequently given 4·4 c.cm.

These figures and opinions indicate that, if pernocton is used, the first intravenous injection should consist of about 4·4 c.cm., that is a little less or a little more than the contents of two ampoules, when the woman weighs 112 lb. (8 st.).

Each author claims reasonable success with pernocton in the dose he recommends. This dose is, therefore, an effective dose, an observation which we have been able to confirm at the Middlesex Hospital in the few cases in which we have used pernocton. Bumm found, when experimenting on dogs, that the minimal lethal dose was ten times as great as the minimal effective dose. It would, therefore, appear that 44 c.cm. (more than nine ampoules) of pernocton would be required to kill a woman weighing 8 st. If this is indeed a fact, a first dose of 4·4 c.cm. can safely be given.

The first injection should be made when the pains of labour are definitely established, most usefully when the woman is becoming distressed and the degree of cervical dilatation is small. Brown, Moloy, and Laird give it when the uterine contractions are powerful and recur at intervals of three to five minutes. The patients fall into deep sleep during the injection of the drug. They remain asleep for 30 minutes to 5 hours, although they may, particularly when the effect of the drug is beginning to wane, moan or return to apparent consciousness during the contractions of the uterus; they do not afterwards remember such happenings.

A second injection is indicated when the patient completely regains consciousness and delivery is not expected for four hours. The second dose should not be greater than half the first; it should be given more slowly than the first.

Goecke and Vogt in Germany, and Bohler in France have been using pernocton for treating eclampsia. Vogt also advocates its use during labour in pre-eclamptic patients. They all claim greater success than can be achieved by any other method of treatment, including that of Stroganoff. There is general agreement among Continental authors who have used pernocton in large numbers of cases that it does not harm the mother, provided the dosage and the technique of injection are correct. Both the first and the second stages of labour are said to be shortened rather than lengthened by its use, although the evidence of this appears to be based upon general impression, not upon accurate analyses of large series of cases.

Its greatest disadvantage is the necessity for continuous observation of the patient, who should never be left after its exhibition. The restlessness and excitement of some of the patients may be difficult to control. Restlessness of greater or lesser degree occurred in 26 per cent. of 100 cases recorded by Schmidt; several of his patients developed incontinence of urine and fæces while under the influence of the drug. These facts prohibit its use outside hospitals and nursing-homes, except for wealthy patients. The relatively short and variable duration of the anæsthesia is a minor disadvantage. Bourne and Williams point out that an antidote, for a case of overdosage, is not known. It is generally accepted that pernocton does not have an untoward effect on the child, although three of the children in Bohler's series of 192 cases were affected.

AVERTIN

During the year 1926 avertin, or tribrom-ethyl-alcohol, which had proved satisfactory as a basal anæsthetic for surgical purposes, began to be used on the Continent for the production of hypnosis and resulting amnesia during labour. Martin, Benthin, and other Continental authors praised it unstintingly; in 1930 Connell published, in an important paper, the first results recorded in the United Kingdom. The technique of its administration is easy; the details are found in his paper in which he recommends the safe dose of 0·075 c.cm. of avertin fluid per kg. of body-weight, that is, about 4·5 c.cm. for a woman weighing 126 lb. (9 st.). The relative simplicity of the technique and apparatus required for its rectal administration are undeniable advantages. Connell recommends the instillation of avertin when the cervix is two-thirds dilated in primiparæ and half dilated in multiparæ, provided the uterine contractions are strong and antenatal examination has pointed to normal labour. Stander has shown that the administration of 1000 mg. of avertin per kg. of body-weight does not produce any alteration in the amount of non-protein nitrogen, urea nitrogen, uric acid, lactic acid, creatinine, inorganic chlorides and carbon dioxide in the blood; the amount of sugar is slightly increased.

Its greatest disadvantage is the excitement which sometimes follows its exhibition. Both Rumpf, who prefers avertin to pernocton, and Kienlin, who prefers pernocton to avertin, refer to the excited state of many of the patients. I have confirmed this at the Royal Northern Hospital in some of the cases in which I have used avertin. These observations clearly indicate that a patient should not be left after the rectal instillation of the drug and that more than one assistant must be present in order, if necessary, to restrain her. Labour is undoubtedly prolonged and, therefore, the incidence of delivery by the forceps is increased.

Naujok discusses several cases of maternal death following, or during, avertin amnesia. He says that veronal, pantopon, and ethyl chloride should never be given after, with or before avertin. He refers to two cases of transitory exanthema, presumably due to avertin, during the puerperium. He is enthusiastic about the value of avertin in the treatment of eclampsia. Stander is against its use in eclampsia because it is detoxicated in the liver; the function of that organ is thought already to be over-taxed by eclampsia. The children do not appear to be directly harmed by avertin, but prolongation of labour and instrumental delivery cannot be of benefit either to the mother or the child. Each dose of avertin must be freshly prepared because of its rapid decomposition into the irritating and nocuous dibrom-acetaldehyde.

SODIUM AMYTAL

Sodium amytal (iso-amyl-ethyl barbituric acid) has enjoyed some measure of popularity in the United States during the past few years. It can be given orally, intravenously, intramuscularly, or rectally.

Most authors recommend the intravenous route and give from grs. 7 to 10. Ruth and Paxon recommend giving the injection when the contractions of the uterus occur every two to four minutes and last from 45 seconds to one minute, and when the cervix is taken up and about 5 cm. dilated. Featherstone and Tait give the large intravenous dose of grs. 15 shortly before the cervix becomes fully dilated. Drabkin and Hurst report satisfactory results by the rectal route, giving 30 mg. per kg. of body-weight. The uterine contractions were weakened in some of their patients and abolished in two.

Hamblen and Hamblin favour the oral route. They give an initial dose of grs. 6 to 15 as soon as labour is definitely established and the cervix begin to dilate—earlier than most other authors. One or two additional doses are given when necessary, but the total dosage should not exceed grs. 30. They claim that the drug is as efficacious when given by the mouth as when given intravenously; this claim is based upon their belief that the depth of the narcosis depends upon the dose and not upon the method of administration.

The great drawback to the use of sodium amytal is the excitement which so often ensues and is referred

to by all authors. Idiosyncrasies are common. Hamblen and Hamblin describe a case in which the patient remained fully conscious after grs. 30, and another case in which serious collapse occurred after grs. 21.

CONCLUSION

The logical conclusion to be drawn from a review of the incredibly large number of drugs and methods at present in vogue for the production of analgesia, with subsequent amnesia, during labour is that the most suitable method for the ordinary case, with one doctor and one midwife in attendance, having regard to safety, ease of administration and expense, is morphia in the first stage and chloroform towards the end of the second stage. For patients in hospitals and nursing-homes, and for affluent patients in their own homes, the most satisfactory drug in the first stage is morphia and, throughout the whole of the second stage, gas-and-oxygen, which should be supplemented by ether towards the end of the second stage.

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BANBRIDGE GENERAL HOSPITAL.—The Duchess of Abercorn last week formally opened the new district hospital at Banbridge, County Down, which has cost £56,000. The former union house has been reconstructed and remodelled, and unsuitable parts of the building and enclosing walls have been removed to obtain additional air and sun. One of the wings is fitted as a maternity home, and another as the nurses' home. The total number of beds contemplated is 93, but in an emergency a greater number can be accommodated. Some distance at the rear is a fever hospital, with accommodation for 44 patients. The building stands high in grounds full of old trees, and the windows command glimpses of the Mourne mountains.

MIGRAINE *

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(*Concluded from p. 126*)

Ætiological and Therapeutic Considerations

WE have been forced to the conclusion that migraine constitutes an extremely complex problem, that there are many types and variants, and that there are many different factors—external and constitutional—at work in the production of this very distressing malady. In discussing the symptomatology reference has already been made to five clinical types—bilious, ocular, menstrual, cerebral, and allergic—to migraine-epilepsy, to the migrainous constitution, and to several other factors which we consider play rôles of varying importance. We propose now to extend the number of these groups and discuss them in somewhat greater detail. The treatment will naturally vary with the suspected causation, and we think it will be most convenient if, at the end of each paragraph on a particular type, we give a brief outline of the treatment which has been advocated as most likely to benefit that type.

AN ALIMENTARY TYPE

Particular attention has been paid by French authors to the "bilious," "abdominal" or "duodenal" type of migraine, in which it is thought that the causative factor is an abnormality in the gastro-intestinal tract or liver. Hunt [1] has discussed carefully the differential diagnosis, in this important and common type of case, between "abdominal migraine," gastric influenza, acute food poisoning, gall-stones, and chronic cholecystitis. The gall-bladder has frequently been blamed for these attacks, but the results of cholecystectomy have in many instances been disappointing. McClure and Huntsinger [2] analysed a group of cases of "abdominal migraine"; in six such patients, whose gall-bladders were removed for organic disease, the headache was unaffected by the operation.

Estimation of the efficiency of liver function is undoubtedly difficult, and there is considerable variation in the results of these tests in this type of case. Nevertheless, there would seem to be a considerable amount of evidence pointing to liver dysfunction as the initial cause, and Hunt suggests that in many of these cases the primary lesion is a subacute hepatitis, resulting from absorption of toxins or bacteria from the intestinal tract (mild colitis or appendicitis) or other areas of infection; such hepatitis may allow the passage of organisms into the gall-bladder causing chronic cholecystitis or the formation of gall-stones, and may be unaffected by the removal of the diseased gall-bladder unless the source of infection is also attacked. He quotes an interesting and suggestive case in which cholecystectomy and many other forms of treatment had

* The opening paper at a discussion at the Harveian Society on Dec. 8th, 1932.

completely failed. The urine at the onset of an attack showed considerable amounts of acetone and urobilin. The patient was ordered to take glucose ½ oz. twice daily and Decholin tablets—one, three times daily, with instructions to double the dose if he felt an attack developing. Seven months later he had not had another attack, although for the previous six years he had not been free for longer than four weeks.

The differential diagnosis between cholecystitis and abdominal migraine is difficult clinically—an onset in youth, more rapid recovery after the attacks, and less definite and localised abdominal tenderness would be in favour of a diagnosis of abdominal migraine.

There are undoubtedly instances of migraine relieved or cured by cholecystectomy, but most cases of this "biliary" type are, in our opinion, associated with hepatic rather than gall-bladder dysfunction, and will respond to the administration of glucose, bile acids, and a general dietetic restriction.

Stimulation of the flow of bile by duodenal catheterisation with or without the introduction of magnesium sulphate has been successful in several cases. Rook [3] has recommended the following régime: after a complete starvation day, give 2 to 4 drachms of a 50 per cent. solution of magnesium sulphate one hour before rising; during this hour the patient lies semiprone on the right side, and he then takes half a pint of hot water or hot tea. This procedure is repeated each week; in addition, fats and in certain cases eggs, chocolate, cocoa, coffee, and alcohol are eliminated from the diet.

Some of these cases resemble clinically the type described by Newman as due to dyskinesia of the gall-bladder, and in these treatment by atropine or belladonna is indicated. In others of the "alimentary" group it appears that duodenal stasis is the primary lesion. X rays may show a wide dilatation with delay, or more usually a "to and fro" movement in the duodenum. Higgins [4] has drawn attention to the occurrence in chronic duodenal ileus of migraine which is relieved by duodeno-jejunostomy.

Opinions differ as to the part played by the "liver-gall-bladder-gastro-duodenal" factor in migraine, but it would appear certain that, although its importance has been exaggerated by some writers, yet there are many cases which are intimately associated with hepatic dysfunction and relieved by its correction.

DIETETIC TYPE

In close association with the above group is the dietetic type; but it is improbable that diet plays an important part in the production of migraine. All manner and varieties of diets have been recommended from time to time—a high fat or a low fat diet, withdrawal of all forms of animal protein from the food, a full carbohydrate diet or one with carbohydrates eliminated—each advocate of a particular diet extolling its virtues and turning a deaf ear to the claims of its rivals. If in a particular case it seems probable from a careful history that diet is an important predisposing factor, then it is justifiable to try the value of sensitisation tests as for asthma. If a positive result is obtained it is clear that the offending article must be excluded; if negative, then omit, first, carbohydrates; secondly, animal protein; and, if still unsuccessful, prescribe a purine-free diet.

Many diets have been recommended on a purely empirical basis, but in such a protean disease it seems unwise to do this. It is probable that quantity and regularity are more important factors than quality.

A METABOLIC TYPE

The observations that acetone is present in the breath before an attack, and that there is an alteration in the pH and alkali reserve in an attack, although between the attacks the figures are normal, have led to treatment by withdrawal of fats and giving glucose and alkalis. Eight injections of 2·0 g. of an 80 per cent. solution of sodium carbonate are given intravenously in addition to sodium bicarbonate by mouth. On the other hand, Barborka [5] reports the results of the treatment of 50 cases of typical migraine by a ketogenic diet—80 per cent. of these patients being benefited by the diet.

The allegation that migraine is due to an inherited or acquired defect in protein metabolism—an inability to detoxicate putrefactive substances derived from animal protein in the intestinal canal—has led to treatment by withdrawal of proteins from the diet, changing the intestinal flora by the addition of *Bacillus acidophilus*, and the relief of spastic constipation in order to secure copious daily evacuations (Diamond [6]). Abnormalities in the uric acid metabolism are invoked to explain other cases of migraine.

The frequent onset of migraine in the early morning, the occurrence of attacks in many cases after prolonged physical exertion or after starvation, the observations of low blood-sugar readings in several cases, and the relief, especially in children, by the administration of glucose have suggested that transitory hypoglycæmia may be an important factor in the production of migraine. We feel that in many cases definite relief is given by the administration of glucose either between the attacks or as soon as notice of an attack is given; although, on the other hand, there are cases recorded where the ingestion of sugar has apparently precipitated an attack. It is difficult to correlate these views and findings.

Muck [7] has produced hemicranial attacks in patients subject to migraine by the induction of alkalosis by hyperpnœa.

It is extremely difficult to assess the importance of the metabolic factor in migraine, but in obscure and therapeutically refractory cases, where investigation reveals a metabolic error, the appropriate treatment should be instituted.

The association of headache, sickness, polyuria, throbbing heart, and constricted peripheral blood-vessels has suggested the resemblance to the clinical picture of a "contracted kidney," and the view has been promulgated that in migraine there is an accumulation in the blood of some toxic substance requiring elimination. The occurrence of migraine in undoubted cases of chronic nephritis has led to the description of the *nephritic* type. We must bear in mind this association, though it is difficult to be certain of the nature or importance of the relationship between these two conditions.

AN ALLERGIC TYPE

Some regard the fundamental cause of migraine as an anaphylactic shock. The well-known relationship with asthma, urticaria, and angioneurotic œdema supports this view. Pagniez [8] has given a full account of the appropriate measures directed to the desensitisation of the nervous system, and good results have been claimed from the administration of weekly injections of 1 c.cm. of horse serum for two months, or from taking 0·5 g. of peptone before each meal or injecting peptone subcutaneously. In one of our cases it was found that the migraine attack occurred only after eating chocolate, and was cured by the elimination of chocolate from the diet; in

another case, recorded by Lubbers,[9] the migraine attack occurred only after eating beans. After a test-meal of beans the leucocytes immediately diminished in number and migraine developed eight hours later. Skin tests were negative; preventive ingestion of 0·5 g. of peptone before eating the beans warded off the migraine, though the patient felt chilly and drowsy.

Thus the treatment of migraine due to food allergy is carried out by "elimination dieting," modified according to the suspected factor.

Rowe [10] has done a considerable amount of work in support of the above views, and Balyeat and Brittain [11] consider that the exciting factor in migraine is probably always a specific sensitivity to one or more foreign proteins, and they would regard physical and mental fatigue as predisposing factors.

VASOMOTOR AND SYMPATHETIC TYPES

Allied to the above is the *vasomotor type*, in which it is held that the migraine is the result of a localised intracranial œdema. Erythromelalgia, attacks of angioneurotic œdema, orthostatic albuminuria, and syncopal attacks were all present in association with typical migraine in a patient recently under observation. Treatment with full doses of calcium lactate or calcium subcutaneously produces good results in such cases. In this connexion it is interesting to recollect the popular treatment for the headache of "the morning after the night before" by calcium lactate.

At this point it will be convenient to refer briefly to the *sympathetic* type. Acting upon the supposition that migraine was dependent upon an excessive stimulation of the sympathetic and a resultant spastic contraction of the cerebral arterioles with subsequent relaxation, an attempt was made to control such vasospasticity by the use of a sympathetic depressor—ergotamine tartrate (2 mg. by mouth). Tzanck, Trautmann,[12] Targhetta, Ignelzi [13] have reported very encouraging results from this treatment. Irradiated ergosterol and calcium therapy were employed in addition, in order to increase the threshold of resistance to sympathetic irritability and to render the migraine attack more amenable to treatment by the ergotamine tartrate.

Dandy [14] has attempted to achieve the same object surgically by removal of the first thoracic sympathetic and inferior cervical ganglia. The results were encouraging, but he preferred to reserve his opinion as to the absolute value of the procedure.

SOME OTHER TYPES

Before discussing the inter-relationship of the endocrine organs, the autonomic nervous system, and migraine, we will refer briefly to the ocular, sinus, fibrositic, para-epileptic, and cerebral types.

Some reference has already been made to the *ocular* type. There is still much difference of opinion as to the importance of the rôle of errors of refraction and slight muscle-balance defects. It is suggested that eyestrain increases the irritability of the central nervous system and thus produces migraine. In the Savill lecture in 1924, Hurst [15] stated the case in favour very ably and strongly; recently Elliot [16] has stressed the significance of ocular abnormalities. Although there are undoubtedly many cases in which the visual apparatus is primarily at fault, and in which migraine is cured by correction of refractive errors, &c., yet we feel that the importance of this factor has been over-estimated.

Whatever the relative importance of the part played by the eyes, it is obviously our duty to see that no person is allowed to remain for years an unrelieved migrainous subject without careful ocular testing and correction along the lines indicated by Elliot.

There are a certain number of true migraine cases with well-marked *sinus disease*, in which the treatment of the sinus lesion has led to cure of the migraine. The association of migraine or migrainous neuralgia with non-articular rheumatism, brachial neuritis, and scalp tenderness in an attack, separates off a further group—the *fibrositic* type. This group should be treated by salicylates, physiotherapy (ionisation), or the local injection of Impletol (a complex combination of a local anæsthetic with caffeine prepared by Bayer). The true cases of migrainous neuralgia respond to alcoholic injection of the Gasserian ganglion or its branches.

FIG. 1

Radiographic appearance of the sella turcica in a normal subject.

The similarity in many respects between migraine and epilepsy and their occurrence in the same patient has led to the separation off, from a pathogenic and therapeutic point of view, of a *para-epileptic type*. The knowledge of this relationship led to treatment of migraine by bromides, luminal,[17] and the ketogenic diet.

Certain cases of typical migraine result from macroscopic intracranial lesions constituting what might be conveniently referred to as the *cerebral* type. In one of our series an occipito-parietal angioma was found, and Collier records a similar case with typical monthly attacks of migraine of three years' duration. The patient died suddenly, and a tumour was found in the convexity of the occipital lobe, corresponding to the field in which the visual phenomena were wont to appear. Further, apparently typical migraine attacks occur in patients who have djed later of a ruptured congenital cerebral aneurysm. This association has been observed and reported too frequently to permit of its dismissal as a coincidence.

Here we might conveniently refer to the much-quoted hypothesis of Spitzer. This author suggested that a congenital stenosis of the foramen of Munro forms the substratum of the migraine constitution. During an attack the foramen becomes plugged by a tag of congested choroid plexus; in this way the intracranial tension is raised, temporary internal hydrocephalus results, and pressure of the cerebral cortex against the unyielding dura causes first the premonitory symptoms and later the headache. Although this speculation has received considerable notice, we must bear in mind that it is purely a hypothetical conception. Spitzer is often quoted as

though he had demonstrated anatomical facts to support his contentions, when actually such is not the case. Quite apart from the lack of evidence, this hypothesis is unconvincing, and any theory based upon raised intracranial tension seems to be contradicted by what we know of the cerebro-spinal fluid pressure in migraine.

THE ENDOCRINE FACTOR

Almost all the endocrine organs have been blamed at one time or another for attacks of migraine. The association on the one hand with hyperthyroidism, or with hypothyroidism on the other, has led to X ray treatment of the thyroid or to the use of Lugol's iodine or thyroid extract. Hartung [18] has reported cases in which the attack was invariably cut short by an injection of adrenaline. The relation between migraine and the ovarian and pituitary secretions is probably more important. The frequent onset at puberty, the intimate relationship with the menses in many cases, and the marked diminution of the attacks after the menopause or during pregnancy are all cited as factors in favour of an endocrine origin.

An abnormal inter-relation is often postulated between the thyroid, pituitary, and the sex glands, and on this theory migraine has become easy game for the pluriglandular therapists. They have not always been discrete or scientific in their use of their products or their claims, and have thus brought endocrine therapy into disrepute. Jelliffe sums up the position in a nutshell when he says: "Naturally the endocrines cannot be neglected—various authors implicate now this, now that, and usually have three or four balls in the hypothetical endocrine air and not all gonads."

FIG. 2

A very good example of a "bridged-in sella" from a man of 23, who gave a history of six epileptiform attacks, but an otherwise normal previous history, and no account of periodic headaches.

In migraine cases showing an intimate relationship with the menses, Hartung [18] has recommended hypodermic injection of anterior and posterior lobe pituitary extract or of whole-gland extract twice a week for the first month and thereafter once weekly, and, in addition, oral administration of the whole powdered gland (gr. 1/20–½). Treatment has been continued for three to four years.

On the grounds that many cases of migraine are due primarily to ovarian dysfunction, Blackie and Hossack [19] have treated several cases of "menstrual migraine" with Collip's placental hormone—Emmenin Complex (Glaxo) ½–1 drachm twice daily, except during the menstrual period. Although their line of treatment was empirical, yet we have found it successful in "menstrual migraine."

Recently A. P. Thomson [20] has reopened the problem of intermittent headache occurring particularly at menstruation, and its association frequently with radiological abnormalities in the sella turcica, as originally suggested by Timme. He would prefer to regard his cases as different from typical migraine, and emphasises that few were able to localise the

FIG. 3

The sella turcica in a man of 47, suffering from traumatic neurasthenia. No history of headache.

headaches, which were never unilateral and never of the expanding type of "classical migraine." For the reasons which we have given in discussing the clinical aspect we feel that we must regard them as migraine variants—"menstrual migraine." Moreover, out of his 25 cases, 10 developed similar headaches at irregular intervals as well as at the menstrual periods.

Thomson suggests that, owing to abnormal ossification around the pituitary body or to unusual development of the diaphragma sellæ, the pituitary body is enlarging in a limited space and therefore gives rise to severe headache. Radiological abnormalities in the sella turcica were demonstrable in 17 out of 25 cases, the most common abnormality being ossification of the interclinoid ligaments.

The work of Aschheim and Zondek and others has demonstrated quite clearly the relation between the activities of the ovary and the anterior part of the pituitary body. Hormones elaborated by the basophilic cells of the anterior pituitary stimulate the ovarian follicles and determine the function of menstruation. Experimentally it is shown that the administration of the ovarian follicular hormone causes a diminution in the activity and size of the pituitary, and the results of treatment by such hormones have been remarkably successful in Thomson's cases and in others of our own. He recommends that three injections of theelin 1 c.cm. (50 rat units each) should be given in the week before the period is due, but when the headaches occur at irregular intervals as well as at menstruation, two to three injections of 50 units should be given regularly each week. It seems possible that it will not be necessary to continue the treatment (there is often unfortunately some local pain for two to three minutes after the injection) throughout the patient's menstrual life. Although we can endorse the therapeutic value of an active ovarian follicular hormone in these cases, yet we dislike the view that the headache is due to pressure of the swollen pituitary body against

the abnormally ossified sella turcica or an unusually well developed diaphragma sellæ. It is, of course, extremely difficult to deny a factor of compression against the diaphragma sellæ, but we feel fairly certain that the abnormal ossification as seen in the "bridged-in sella" does not cause compression of the pituitary body. There is ample space laterally for the pituitary to enlarge, and if the sellar tension was raised to the extent which is suggested we might

FIG. 4

An almost completely "shut-in sella" in a woman of 32, who had suffered from migraine-epilepsy for many years. There was no relation between the attacks and the menstrual periods.

reasonably expect some ballooning of the sella. Thomson mentions his failure to demonstrate the "bridged-in sella" in individuals who do not complain of headaches.

We, however, have collected several cases of "bridged-in sellæ" from patients who have never suffered from migraine (Figs. 2 and 3). It appears then that such radiological abnormalities are found in patients of either sex without any history of headaches, and also in cases of migraine or intermittent headache not of the menstrual type (Fig. 4), and we have a patient closely resembling Thomson's cases, in respect of the relation to the menses, who has an almost completely "shut-in sella" and yet gives a history of typical migraine attacks in addition to the menstrual headache (Fig. 5). This case seems to argue in favour of our view that the intermittent headache referred to by Thomson is a migraine variant. We propose to deal more fully with this interesting problem in a subsequent paper.

PSYCHOLOGICAL ASPECTS

As we have pointed out in discussing the migrainous constitution, there is no doubt that in many cases the psychological factor is of considerable importance. True attacks of migraine are very frequently encountered in association with mental overwork, anxiety, or "suppressed rage and humiliation." We have one patient who said that, by allowing himself to get very annoyed and "worked up," he could almost "throw himself" into an attack. Hilda Weber [21] has recently discussed very fairly and clearly the psychological factor in migraine, and reported a case in which a migraine attack was a means by which the unconscious found expression.

The main purpose underlying the attack "was the preservation of the infantile narcissism and the connected feelings of omnipotence." From earliest years this patient by her migraine had achieved a two-fold end; it not only kept her at home but it also enabled her to make an otherwise harsh and tyrannical mother her slave. During the attacks she became the centre of the family attention, and this in itself must have gone far to compensate for the pain which she suffered. Much as she disliked physical discomfort, she hated still more the pangs of thwarted self-love.

Excellent results followed psychotherapy, and without in any way exaggerating the importance of the psychological factor, it seems clear that other cases like the above will respond to psychotherapy when other means will fail.

Conclusions

Ætiology.—Migraine is obviously a complicated and difficult problem, and despite an immense amount of research the essential causation still remains obscure. It seems certain, however, that there must be at least two factors, "central" and "peripheral." In the present state of our knowledge any view must be speculative, but we are inclined to regard migraine as a vasomotor manifestation associated with spasm of the cerebral arteries—most commonly branches of the internal carotid—due to stimulation of sympathetic fibres, either as the result of direct pressure or via the endocrine system, occurring in a susceptible person with the migrainous constitution and with precipitating factors—metabolic, alimentary, ocular, sinus, &c.

Investigation.—Success in treatment will depend on ability to place a particular case of migraine in its proper category and apply the appropriate remedy. It follows that the complete investigation of a patient with migraine will include:—

(1) Careful previous and family history and a minute study of the symptomatology.
(2) Physical and psychological examination.
(3) Careful testing for ocular abnormalities.
(4) Radiological examination of sinuses, sella turcica, gall-bladder, and gastro-intestinal tract.

FIG. 5

The sella turcica in a woman of 47, having severe migraine attacks (with visual phenomena), occurring chiefly at the menstrual periods but not invariably so.

(5) Full examination of the cerebro-spinal fluid, including pressure readings.
(6) Biochemical investigations (blood-sugar estimation, urine, alkali reserve).
(7) Basal metabolic rate investigation.

Treatment.—It is customary to discuss the treatment of migraine under two headings: (*a*) in the attack, and (*b*) between the attacks. In the former it is useless trying to "fight off an attack," and we would recommend retirement to a quiet darkened room as soon as possible, and the administration of one of the following:—

(1) Veramon grs. 6—repeat in half an hour.
(2) Phenacetin grs. 15 and caffein. cit. grs. 5, to be repeated, if necessary, at hourly intervals for three doses.
(3) Compral, 3 tablets every six hours.

Between the attacks some of the cases may suitably be treated with magnesium sulphate, glucose and bile acids, theelin, thyroid, special diet, or psychotherapy. The remaining group of migraine cases, which we are unable to place in a special category, must be regarded for the present as idiopathic, and treated with one of the following:—

(1) Luminal, gr. ½–1 bis die.
(2) A prescription similar to Gowers' mixture:—

℞
Sod. brom. .. .. gr. x.
Liq. trinitrin .. .. ♏ i.
Liq. strych. .. .. ♏ v.
Ac. hydrochlor. dil. .. ♏ x.
Tinct. gelsem .. .. ♏ v.
Aq. chlorof. ad ℥ ss. .. ℥ ss. ter in die post cibos,

or ℞
Ext. thyroid .. .. gr. ½ three times daily.

For the very severe cases which do not respond to any of the above measures we would recommend a right subtemporal decompression. Gordon Holmes says that he has never known migraine persist in a patient who has had a surgical or traumatic decompression.

Therapy is undoubtedly difficult in such a polymorphic disease, but we must not allow ourselves to become despondent, despite the importance of the hereditary factor and the migraine constitution.

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OBSERVATIONS ON GALL-STONE CASES

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GALL-STONES are formed for the most part in the gall-bladder, either as a deposition from the bile in some metabolic disturbance or secondarily to cholecystitis, however that may be produced. When they are found in the common duct they have usually passed into it from the gall-bladder, but in a small proportion of the cases they either come direct from the liver or are formed in the common duct itself. Those which come from the liver are bilirubin stones and splenectomy may be required to prevent recurrence; those which form in the common duct appear as a result of cholangitis, past or present, and may be single or multiple, are often quite large, contain little if any cholesterin, and crumble easily. An appreciable amount of cholesterin is evidence of formation in the gall-bladder. If symptoms of a stone in the common duct recur, the most usual cause is that the stone was overlooked at the first operation.

The relative frequency of stones in the gall-bladder to stones in the common duct coming to operation is about 15 to 1, and though circumstances may render gall-bladder stones and their treatment a danger to the patient, stones in the common duct are certainly a greater menace to life and present more difficult problems to the surgeon.

The success of operations on the common duct depends very largely, in my opinion, on pre-operative preparation against those factors which are responsible for the deaths. It is not always easy to be sure of the real cause of death, but in 75 post-mortem examinations made during six years on patients dying in the Leeds General Infirmary after operations on the biliary passages the prominent features were:—

1. Peritoneal sepsis—mostly local, sometimes general 27
2. Broncho-pneumonia (without peritonitis) 17
3. Cholangitis 10
4. Myocardial degeneration 10

In these 75 cases the operation performed and the cause of death given (tabulated as above and in the same order) were:—

Cholecystectomy (36)		Cholecystotomy (17)		Choledochotomy (22)	
1.	14	1.	8	*1.	5
2.	9	2.	4	2.	4
3.	2	3.	1	3.	7
4.	3	4.	2	4.	5

* Four of these had a gall-bladder operation at the same time.

In many of the cases there were multiple findings at autopsy—e.g., toxic changes in the heart, liver, kidneys, and lungs were not uncommon in the cases with peritonitis, as would be expected, but so far as possible the causes of death here given show the primary lesions. Broncho-pneumonia, for example, is only given separately when it was not accompanied by acute infection elsewhere. Again, myocardial degeneration is given as the cause of death only when it was the predominating lesion, but some defect in the heart muscle was quite common, and it is impossible to exclude its influence in some of the broncho-pneumonic cases. Bearing in mind these limitations and the fact that the number of post-mortems is small, yet some interesting features are revealed.

PERITONITIS

The predominating cause of death is peritonitis—usually local, occasionally general. It accounts for more than a quarter of the total mortality. A degree of local peritonitis is a necessary reparative process, and possibly some reduction should be made to allow for the pathologist's over-statement on this account. But where there is a suppurative peritonitis (as in practically all the cases here reported) it should be regarded as a pathological lesion. It is well known that acute infective processes in the gall-bladder can be trusted to remain localised; we feel so confident of this that a policy of operative delay is deliberately taught and practised. The delay is usually a matter of a week or so, by which time the acute symptoms have subsided. At this stage it is common to find considerable peritoneal injection, if not actual pus, around the gall-bladder. This is especially the case when a stone is impacted in the neck of the gall-bladder, the type of lesion which accounts for most of the cases coming under the heading of acute gall-bladders. In fact, there is a state of affairs resembling very closely the acute obstructed appendix; in both cases perforation is a

common complication, but there is this difference—in the former we know that the mischief will be localised, in the latter we fear it will not be. In the first case we wait; in the second we operate at once, and in both instances we are pretty sure the patient is safe, at any rate, for the time being. Why, then, should there be such a large percentage of peritonitis in the mortalities which follow gall-bladder operations? I believe it is due to one of two reasons (I exclude introduction of organisms from outside; this surely cannot be a factor in these days):—

1. The infection is not localised so readily as we think; this seems an unlikely explanation since general peritonitis is not common with acute gall-bladder infections.

2. Operation is performed at the wrong time. It is customary to wait a week or so for symptoms to subside and then to operate. Usually, of course, things go all right, but sometimes there is still active inflammation, and perhaps pus; then the size of the wound and the manipulation necessary to do what is required must disseminate the infection rather widely, into freshly opened-up local areas, or even into the general peritoneal cavity. What should we think of a surgeon who made such inroads in the presence of a persisting infection around the appendix?

That this is probably the true explanation is supported by the figures of fatal peritonitis following gall-bladder operations as compared with those of common duct operations, where a really active pericholangitis is rarely seen—41·5 per cent. as against 22·8 per cent. (5 in 22 autopsies after a common duct operation; in 4 of these the gall-bladder was removed at the same time).

The practical inferences to be drawn seem to be: either to operate on the acute gall-bladder at once, as we do on the appendix (the cases I have treated in this way have done very well), or to leave things to settle much longer than is the custom at present. The thing to avoid is operation during the stage when active pericholecystitis may still exist.

FATAL LUNG COMPLICATIONS

In the absence of a local suppurative condition these follow any of the three operations with about the same frequency. When suppuration is present the lungs are involved in most cases, but not more often, I think, than we expect to see after operations on suppurative lesions anywhere. Lung complications, not necessarily fatal, are seen, I believe, more frequently after gall-bladder operations than after most other intra-abdominal manœuvres, partly because of the technical difficulties in a very sensitive field so near the diaphragm, and partly because obesity renders these patients peculiarly vulnerable. Most gall-stone patients are fat, and the difficulties of operation are thereby increased. But excessive fat increases the risks to the patient in other ways too. Fatty tissue has a low resistance to infection, and where the common duct or gall-bladder contain organisms there is apt to be some infection in the wound. This in itself is not likely to be serious, but more retraction is necessary than in thinner patients in order to expose the essential parts, and this makes breathing more painful afterwards. Large or small areas of atelectasis are apt to be induced thereby, and this, together with the low-grade infection in the fatty wound, may determine the onset of septic broncho-pneumonic areas. Infarcts of the lung are more common, too, in fat patients; possibly these two conditions are one and the same, but I think not. There are reasonably reliable tests of function of some organs to inform the surgeon whether the organs are capable of doing what they will be called upon to do, but with the lungs it is different; we rely on the ordinary clinical examination for evidence of reasonable soundness and virtually know very little about their vital capacity. I admit I do not see quite how we should proceed in this matter, but there are certain physiological methods which might be applied and give us a better understanding of the functional efficiency and elasticity, so to speak, of these organs under stress. The empirical use of carbon dioxide has done a good deal, I think, to lessen undesirable lung complications.

CHOLANGITIS

Cholangitis is the cause of death much more frequently after common duct operations than after those on the gall-bladder—31·8 per cent. against 5·5 per cent. It is many years since E. V. Graham [1] pointed out that hepatitis is a more or less constant factor in cases of cholecystitis, and I have corroborated this,[2] and at the same time shown some apparent connexion between the degree of hepatitis and the results of the van den Bergh and lævulose-tolerance tests. The lesion is a pericholangitic small-celled infiltration, sometimes with fibrous and fatty changes. Interpretation of the hepatitis differs, but it is agreed that the condition is most advanced in the common duct cases, leading in extreme instances to intra-hepatic abscesses. The damage to the liver is caused either mechanically by back pressure, often associated with sepsis, or by poisoning of the parenchyma by the retention products carried in the blood stream, whatever the nature of these may be. The cause is probably not bilirubin itself, but bilirubinæmia has considerable practical interest; it acts as an indicator, giving information of what is occurring in the liver, rather as urea in the blood does for the kidneys in prostatic enlargement. In either case the rise is due to retention, and indicates damage to the organ involved. In such circumstances we should do a two-stage operation for prostatic enlargement, and the same principle applies to common duct obstruction due to stone; but there is this difference: in the former instance we have to relieve the back pressure by surgical means, whereas in the latter it is done by Nature if we will have the patience to wait, since it is rare for a stone completely to block the common duct for long.

The dangerous periods, so far as the liver is concerned, are during the time the bilirubin curve is rising rapidly, which it does when the duct becomes suddenly blocked, and when the curve is rising gradually and continuously to a high level, as in malignant obstruction. In the first case the wise course is to wait for a falling curve, which will almost certainly appear in quite a short time, and in the second (if any operation is to be performed) not to delay too long, for a remission of the jaundice is most unlikely.

It is only possible to be sure of the state of affairs by doing repeated van den Bergh tests, because there is a rising curve for bilirubin in the blood before jaundice reveals itself clinically. The van den Bergh reaction in this obstructive type of jaundice is, of course, always of the prompt direct variety. The trouble with hepatic tests is that, though they may give evidence of liver inefficiency, they are not able in most instances at present to demonstrate the degree of injury. But if we look upon hyperbilirubinæmia as an indicator of some hepatic damage, in the same way as we do high blood-urea in kidney conditions, and deal with it on similar principles, I think we shall do much to ward off two of the factors

which threaten patients with stone in the common duct—viz., hepatic failure and post-operative hæmorrhage.

THE HEART

The post-mortem findings in the heart are myocardial degeneration in some 22·8 per cent. of common duct cases and about 7 per cent. of gall-bladder cases. It is difficult to be sure of the significance of this observation, since some myocardial defect is so commonly seen in many gall-stone cases. But so far as I can judge from the available evidence, the greater frequency in common duct cases is related in some way to the presence of jaundice. Retained biliary products have a definitely toxic effect on the parenchymatous tissue of organs; this is seen clinically in the kidney, where deep obstructive jaundice is sometimes associated with albuminuria and a high blood-urea. Experimentally, intra-peritoneal injections of bile are fatal to rabbits, and intravenous injections are fatal in even small doses. Death results from changes in the myocardium, where necrosis is produced, and severe degeneration is also found in the kidneys and liver. The heart is perhaps peculiarly vulnerable in these circumstances in the human being because of the prevalence of fatty infiltration in obese subjects.

PRE-OPERATIVE TREATMENT

It is seldom necessary to rush operation in common duct cases; and I believe that preparation for operation is a very vital factor, and one which does not receive the attention it should. Consequently the total mortality of common duct calculus cases is reported as being in the neighbourhood of 15 per cent. My own mortality is 7·5 per cent.; 4 per cent. in private patients and 10 per cent. in hospital cases. I feel confident that this has been achieved very largely through careful, and sometimes long, preparation.

In addition to the ordinary medical care of the patient, of which rest in bed is perhaps the most important, the methods employed before operation (and they may be needed afterwards as well) are as follows:—

1. *Water.*—This should be given very freely, because dehydration is not uncommon in jaundiced patients, and also it flushes the kidneys and so tends to remove the renal threat, which is a real one in many cases. If the common duct is drained to the surface as much as 1500 c.cm. of fluid may be lost in 24 hours; this can be prevented to some extent by using a T-tube.

2. *Glucose.*—This is essential and may be given by any route along which absorption is certain. Repeated or continuous intravenous injections seem to be most effective, and 10 per cent. glucose and 1 per cent. saline solutions should be used. In addition to being an easily assimilated form of food, it seems to have an especially beneficial effect on the liver and kidneys.

3. *Calcium.*—If there is reason to suppose there may be post-operative bleeding, 5 c.cm. of 10 per cent. calcium chloride is usually given on three consecutive days; I am not at all sure that calcium chloride is reliable, and I much prefer one or more blood transfusions. In addition to an efficient anti-bleeding effect these supply a vitalising factor of great potency, and are therefore useful even when post-operative hæmorrhage is not anticipated.

SURGICAL TECHNIQUE

Most anæsthetics damage living cells, and it is necessary to choose that one which produces the least insult to the liver, particularly in common duct cases. I have no doubt in my own mind that spinal anæsthesia best fulfils the conditions. It has other great advantages but some drawbacks, the chief of which lies in getting it to the right level. This is largely a matter of attention to detail and accustoming oneself to the behaviour of one of the many techniques from which a choice may be made.

Owing to the remarkable variation in the anatomical arrangements of the bile-ducts and the hepatic and cystic arteries, some of which I have described,[3] there are perhaps more traps for the unwary in the surgery of this region than in any other, and it is therefore of the utmost importance that nothing be divided that has not been clearly identified. This should be a very obvious principle, but it is by no means always applied; it requires not only unremitting care and infinite patience to define the essential structures, often in trying circumstances, but also great gentleness, as the parts are highly sensitive to manipulation.

It is especially important to prevent chilling of the portal blood in common duct cases. Crile applies diathermy to the external surface of the body over the liver; I have no experience of this, but have used hot applications, and by means of thermometers inside the abdomen I have not been able to detect any material rise in temperature. The most practical method is the use of hot moist intra-abdominal packs, as is the usual practice, but extra precautions should be taken to keep these warm and to prevent the exposure of viscera.

With adequate pre-operative preparation it is usually safe to remove stones from the common duct and perform cholecystectomy (since the bladder in these circumstances generally needs removal) at the same time, but occasionally the patient is so ill with cholangitis that drainage of the common duct is all that is permissible; the stones can be dealt with at a subsequent operation.

When operating for a supposed stone in the common duct careful palpation may fail to detect one; is it necessary to open the duct and explore from the inside to make sure? Generally I should say no, but there are occasions when I believe it is impossible to be sure without open exploration:—

1. When the head of the pancreas is thickened and hard. It is easy to miss a stone in these circumstances, especially in the region of the ampulla.

2. When the common duct has lost its normal bluish colour, and is rather thickened and dilated. Dilatation with a contracted gall-bladder is usual and does not necessarily mean obstruction, but if there has been jaundice one should make absolutely certain the duct is clear, and this may be impossible with a small stone without opening the duct. It is as well to remember in this connexion that some 25 per cent. of patients with stone in the common duct have never had jaundice and about 5 per cent. do not give a history of pain.

The post-mortem records are interesting in that stones were found in the common duct in 6 out of 33 cases dying after cholecystectomy, no operation having been performed on the common duct. Stones were found at autopsy in the common duct in 3 out of 22 cases dying after choledochotomy. These cases are not quite so convincing as the first series, since the notes gave no indication whether the duct was intentionally merely drained.

When there is a stone in the lower end of the common duct it is better to remove it through the duodenum than to make a prolonged effort to get it into the supra-duodenal portion. Trans-duodenal choledochotomy certainly has no greater mortality than

the more usual operation and has the advantage that bile flows into the intestine instead of to the surface. It has this further point in its favour: if no operation is performed on the gall-bladder at the same time the wound may be completely closed, whereas such a piece of technique after supra-duodenal choledochotomy is very risky.

During the final stages of any operation 10 per cent. carbon dioxide in oxygen is given, and this is repeated for ten minutes in each hour for several hours after the patient has returned to bed. I think two good effects are promoted by this: first, the lungs are more fully inflated by the deeper breathing, and atelectasis (which is probably the beginning of much post-operative chest trouble) is discouraged; secondly, better oxygenation of the blood is provided. I think there is no doubt that anoxæmia is responsible for some of the fall in blood pressure which follows many anæsthetics and particularly spinal administration. In addition, many of the special methods employed in pre-operative preparation should be carried on in the after-treatment as a routine.

References.—1. Graham, E. V.: Surg., Gyn., and Obst., 1918, xxvi., 521. 2. Flint, E. R.: Brit. Med. Jour., 1930, i., 1041. 3. Idem.: Brit. Jour. Surg., 1923, x., 509.

DYSENTERY AS A CAUSE OF SUDDEN DEATH

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That dysenteric infection may prove rapidly fatal, so rapidly in fact that in certain cases there may not be time for the development of any symptoms of the disease, does not seem to have been previously noted. The following cases are recorded with a view to drawing attention to this point. Every case was the subject of a coroner's inquiry. In two of them death occurred suddenly, and no cause was apparent before the post-mortem examination; in the remaining three it was evident that some form of intestinal infection was the cause of death.

CASE RECORDS

Case 1 (male, aged 9 years) retired to bed, apparently in normal health, but woke up at 3.30 A.M., vomited copiously and died within one and a half hours.

At post-mortem examination the body was that of a well-nourished male child. The cranial and thoracic cavities showed nothing abnormal. The spleen was rather enlarged and firm in consistency, and on section the cut surface showed numerous white dots marking enlarged and probably necrotic Malpighian corpuscles. The stomach contained some clear yellow fluid; the mucous membrane appeared healthy. The whole of the small bowel from the jejunum downwards contained a great deal of thick mucus. In the ileum the Peyer's patches were prominent and showed evidence of early necrosis of lymphoid elements; towards the lower end of the ileum small patches of lymphoid proliferation in the mucosa became evident; these increased downwards until the last few inches before the ileocæcal valve were thickly studded with them, and at the valve itself there was a definite ring of lymphoid proliferation and hyperplasia. This hyperplasia diminished rapidly from the valve downwards; the lower part of the large bowel was filled with liquid fæces.

Case 2 (male infant) appeared well when he was put to bed but was found dead a few hours later.

At post-mortem examination the body was that of a well-nourished infant; there were small petechial hæmorrhages scattered over the face and neck. The brain substance was soft. The heart and lungs were normal. In the abdominal cavity there were numerous enlarged soft mesenteric glands. The spleen and liver appeared normal; the kidney showed cloudy swelling. Nothing abnormal was seen in the stomach, duodenum, or jejunum. The ileum showed increased prominence of Peyer's patches from above downwards; towards the cæcum there was evidence of early ulceration. In this area the mucosa was covered with closely packed white nodules of hyperplastic lymphoid tissue, and these formed a definite ring around the ileocæcal valve. The whole of the large bowel showed intense proliferation of the lymphoid elements, which appeared as prominent white dots. The lower bowel was filled with liquid fæces.

Case 3 (male, aged 3 years) appeared well when he went to bed; he woke up at 6 A.M., vomited once and passed a loose stool with no obvious blood; diarrhœa continued until midday. The temperature was 101°–103° F., but his condition did not cause his doctor anxiety until the evening, when he became very collapsed and died at midnight.

At the post-mortem examination he was a well-nourished male child. The small bowel contained yellowish fluid fæcal matter, and the lower part of the large bowel was ballooned out with a large liquid stool containing mucus but no blood. Peyer's patches throughout the ileum were very prominent but showed no signs of necrosis; the mucous membrane of the lower few inches of the ileum and cæcum and the whole of the large bowel showed an intense proliferation of the lymphoid elements but no actual ulceration. A ring of lymphoid tissue similar to that described in the previous cases was found round the ileocæcal valve.

Case 4 (male, aged 6) suffered from diarrhœa of sudden onset which affected the whole family simultaneously. This boy collapsed and died within 12 hours; the rest of the family recovered. Cultures from the stools of a sister yielded *B. dysenteriæ* Sonne.

Post-mortem examination showed the intestines distended with gas; the contents were fluid, with some mucus but no obvious pus or blood. Peyer's patches throughout the ileum were very prominent but showed no signs of necrosis. The lower six inches of the ileum showed intense proliferation of lymphoid elements, increasing towards the caput cæcum where the hyperplasia almost surrounded the bowel. There was considerable reddening and œdema of the large bowel.

Case 5 (male, aged 65 years) had been in poor health for some time; he ate some pork at midday with the rest of his family and was taken ill at midnight with diarrhœa and vomiting, and died within 24 hours. He had no rise of temperature during the illness. The other members of the family escaped without severe symptoms. Post-mortem examination showed the same lymphoid hyperplasia of the ileum and the ileocæcal valve which was noticed in the other cases.

COMMENT

The most striking feature on post-mortem examination common to all the cases was the presence of a ring of lymphoid hyperplasia and œdema around the ileocæcal valve; this varied in size and extent from case to case; in some it extended for several inches up the ileum and down the cæcum. In some cases the ring was complete, in others not entirely so, but in every case it was a striking feature. No record of this appearance has been found in descriptions by other workers of post-mortem examinations on cases of dysentery. Charles and Warren [1] give a detailed account of the findings in fatal cases in the Newcastle epidemic but, though they describe folliculitis of the large bowel, which was also noted in the cases recorded above, they do not mention the intense lymphoid hyperplasia at the ileocæcal valve. A possible explanation of this discrepancy is that the ileocæcal hyperplasia may be a feature of the most fulminating cases, of which all those recorded above were examples.

Cultures were taken from the mucosa and contents of the bowel at several different levels and from the spleen in each case, but no organisms of any pathological importance were isolated. Failure to identify these from any of the cases may be attributable to the fact that in no case was the post-mortem examination made until the second day after death and in some cases not until the third. On account of this failure

[1] Charles, J. A., and Warren, S. H.: The Lancet, 1929, ii., 626.

no definite proof exists of the nature of the infecting organism. The fact that *B. dysenteriæ* Sonne was isolated from a sister who had been ill at the same time as Case 4 makes it likely that in this case, at any rate, the infecting organism was of the Sonne type.

In 1926 Fraser, Kinloch, and Smith [2] reported an outbreak of dysentery in Aberdeen. In 1929 Charles and Warren [1] recorded a similar outbreak in Newcastle. Various other writers have described smaller epidemics. The attention of this department was directed to the matter by an outbreak in the children's ward of the Royal Hospital in 1928, and since then there have been two smaller outbreaks. In spite of the attention that has been drawn to epidemics of bacillary dysentery in the last few years, there does not appear to be general recognition of the fact that the disease is endemic in this country.

It is well recognised that in certain cases of Shiga and Flexner infection the toxæmia may be so overwhelming as to bring about a very early fatal termination. Charles and Warren have recorded several cases of the sort, but the Sonne bacillus has in the past usually been regarded as only mildly toxigenic. Fulminating infection with rapid death due to *B. dysenteriæ* Sonne, as in Case 4, does not appear to have been reported before. That death should occur as the result of a dysenteric infection without the appearance of the cardinal symptom of diarrhœa, as in Cases 1 and 2, does not seem to have been previously noted. This possibility should be borne in mind in cases of sudden death in children.

The post-mortem examinations on all the cases recorded were made by Dr. S. C. Dyke, pathologist to the hospital, at the instance of Mr. J. T. Higgs, coroner for South Staffordshire, and of Mr. A. C. Skidmore, coroner to the borough of Wolverhampton. I am indebted to the coroners concerned for permission to publish the cases; to Dr. D. E. S. Cunningham, of Upper Gornal, for material; to Dr. M. W. Wallace, of Wolverhampton, for the history of Case 3; and to Dr. Dyke for access to his notes and for advice and assistance.

TUBERCULOUS LARYNGITIS:
THE IMPORTANCE OF EARLY DIAGNOSIS

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Tuberculous laryngitis is pre-eminently a disease in which early diagnosis is all-important for successful treatment. As it is, with exceptions so rare as to be negligible, a complication of pulmonary tuberculosis, it can normally be recognised early if it is looked for; and I wish here to urge again, as I have done for over 25 years, that all phthisical patients must have their larynges inspected at regular intervals of a few months, whether or not they have symptoms referred to the throat, and that they be sent to a laryngologist if this complication cannot be excluded with certainty. A good many consumptives suffer from hoarseness, or have a characteristic weak voice; this is often merely the result of asthenia, but these patients also have an unusual tendency to attacks of simple laryngitis, partly from the strain of coughing and partly from infection by secondary organisms in the sputum. On the other hand, a tuberculous lesion, perhaps in the posterior commissure or at the upper aperture, does not necessarily cause any symptoms in an early stage, and the disease can, therefore, neither be diagnosed nor excluded by the patient's symptoms alone, but only by laryngoscopy.

Invasion of the larynx is usually the result of the entrance of tubercle bacilli contained in the sputum directly through the epithelium, and takes place most often in the neighbourhood of the vocal process where the mucosa is thin, closely applied to the cartilage, and liable to abrasion from coughing. The earliest lesions are, therefore, most often found at the level of the glottis and tend to spread from behind forwards along the vocal cord, or backwards to the posterior commissure. The upper aperture is seldom involved before the glottis, although not infrequently swelling of the arytenoids is the first lesion to attract attention, and the epiglottis is rarely attacked until the rest of the larynx has been extensively affected. It is often said that pallor is a characteristic feature of tuberculous laryngitis, but this is only partly true. Many consumptive patients are anæmic, and then the larynx, together with the other mucous membranes, will also be anæmic; in other cases the colour is normal or reddened from coughing and irritation by the sputum. Tuberculous granulations are usually pallid, the margins of ulcers are not hyperæmic, and arytenoid infiltrations are pale; but the unaffected portions of the larynx have no characteristic colour, and very often tuberculous infiltration on the cords, ventricular bands, and especially on the epiglottis, has a deeply congested red coloration. Granulations are typically of a soft, gelatinous appearance; when healing occurs there is but little fibrosis or deformity, in contradistinction to the lesions of syphilis or lupus, and stenosis causing dyspnœa is extremely rare.

Fig. 1 Fig. 5

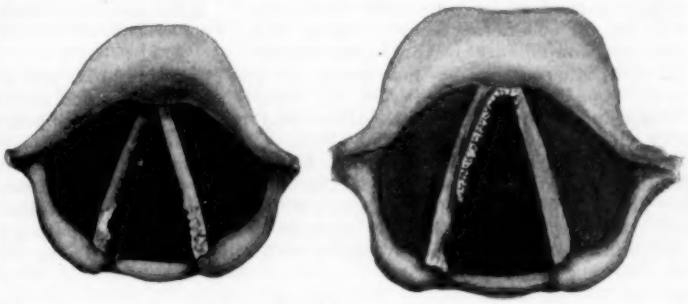


Fig. 1.—Tuberculous infiltration of vocal cords.
Fig. 5.—Epithelioma of vocal cord.

The illustrations are taken from "Diseases of the Larynx," by Harold Barwell, third edition, 1928. Oxford University Press.

CLINICAL VARIETIES

As any part of the larynx may be affected, the clinical picture is very variable, but for the sake of clearness five types may be described.

1. In the "chorditic" type the vocal cords are principally affected, and hoarseness and aphonia are early symptoms. The lesions are seldom symmetrical. Swelling and redness confined to one cord is not due to simple laryngitis; it may be caused by traumatism,

[2] Fraser, A. M., Kinloch, J. P., and Smith, J.: Jour. Hyg., 1926, xxv., 453.

syphilis, or early epithelioma, but is highly suspicious of tuberculous laryngitis and should lead to a careful examination of the lungs. The posterior part of the glottis is chiefly affected; a pale shallow ulcer or erosion on the vocal process is very characteristic, or small soft granulations spreading from this region forwards along the cord (Fig. 1). In other cases the process is more indurative, and the cord becomes the seat of a firm pink nodular deposit, or again, may be converted into a broad red band of granulation tissue which adheres somewhat to its fellow on abduction. Ulceration is common, and one or both cords may be completely destroyed.

2. In the "interarytenoid" form the posterior commissure is the region chiefly affected; there may be hoarseness or no symptoms at all, and the disease is usually of a chronic indolent type. The condition may resemble very closely the pachydermatous form of chronic laryngitis and, indeed, pachydermia has been considered by some authorities to be tuberculous. In pachydermia the thickenings are of a firm and solid appearance, of an opaque white or pale pink colour, symmetrically placed with a depression in the middle line of the posterior commissure, while the typically umbilicated swelling of the vocal processes is very characteristic (Fig. 6). On the other hand tuberculous granulations in this situation are irregular and asymmetrical, soft and semi-translucent, and are often but the edge, or the granulating base, of an ulcer seen foreshortened in the mirror (Fig. 2).

FIG. 2

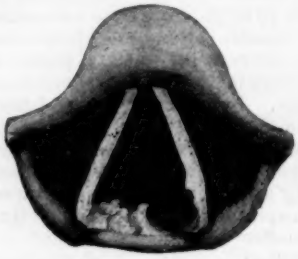


FIG. 6

FIG. 2.—Interarytenoid granulations arising from a tuberculous ulcer in the posterior commissure.
FIG. 6.—Pachydermia laryngis.

FIG. 3

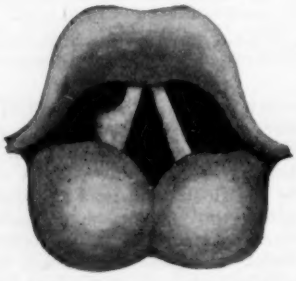


FIG. 7

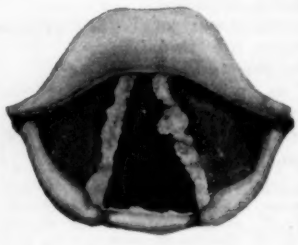


FIG. 3.—Tuberculous infiltration of the arytenoids.
FIG. 7.—Syphilitic infiltration of cords and ventricular bands.

3. In the "aryteno-epiglottic" type the disease, attacking the upper aperture, overshadows the lesions in the interior of the larynx. This form is the most easily recognised, and is the most serious on account of the massive infiltration produced, and because it causes the dysphagia which rapidly undermines the patient's resistance. The pyriform swelling of the arytenoids is distinctive; bilateral, except in the earliest stage, but not always symmetrical, the peculiar pale gelatinous infiltration is highly characteristic and is readily distinguished from the red transparent appearance of true œdema (Fig. 3). On the epiglottis the swelling assumes a sausage-shaped form, is red in colour, and ulceration occurs early on its laryngeal aspect; the swollen epiglottis and arytenoids form a picture which has been likened to a turban and is pathognomonic (Fig. 4).

4. There is a "lupoid" form of tuberculous laryngitis associated with a chronic fibrosing type of pulmonary phthisis; it is characterised by slow progress, little pain, and a tendency to heal with formation of scar tissue. The epiglottis is affected early, and the prognosis is relatively favourable. There is no sharp line dividing this affection from laryngeal lupus.

5 Miliary tuberculosis occurs in the larynx as a terminal affection in rapidly progressing phthisis. The typical miliary tubercles show up as grey points scattered on the bright red swollen mucosa and quickly break down into ulceration. The palate and fauces are often similarly affected, and the lesions are intensely painful.

DIFFERENTIAL DIAGNOSIS

The great majority of cases can be readily recognised by inspection, and it is not uncommon for the disease to be diagnosed in the larynx before it has been suspected in the lungs. The difficulty most often encountered by medical officers of sanatoria is to distinguish a simple laryngitis from early tuberculous invasion in a patient known to have phthisis; the error of mistaking catarrhal for tuberculous laryngitis is the less serious, for vocal rest and simple treatment will cure the condition and no harm will have been done. In the earliest stage tuberculous invasion may show little to distinguish it from simple catarrh, and it is therefore wise to treat an apparently simple laryngitis in a consumptive patient with respect and to be guarded in its prognosis. If one cord only be affected,

FIG. 4

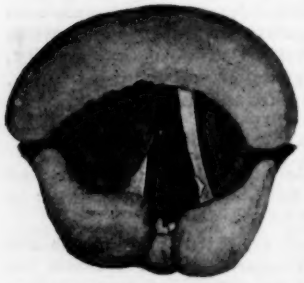


FIG. 8

FIG. 4.—Tuberculous infiltration of epiglottis and arytenoids.
FIG. 8.—Syphilitic ulceration of cords and epiglottis.

the lesion may be due to tubercle, syphilis, cancer, or traumatism, but not to catarrh, and neither ulceration nor granulations occur in the latter. The distinctions between typical tubercle and typical syphilis are very marked. The tuberculous ulcer is slow in growth, with ill-defined margin and no surrounding injection, and the base is covered by pale granulations of a yellowish speckled appearance; on healing contraction, scarring, and deformity are of the slightest. In syphilis the superficial ulcer has a well-defined margin surrounded by a distinct zone of hyperæmia, and its base is smooth and flat; the deep ulcer is crateriform, with sharply punched-out, undermined, and often "mouse-nibbled" edge; healing leaves a dense scar tissue with much contraction and deformity. Syphilis shows a predilection for the epiglottis and, spreading from the fauces, attacks its anterior aspect, whereas tubercle reaches this region from the interior of the larynx, so that ulceration affects the laryngeal surface and the rest of the organ is usually already extensively involved; syphilitic lesions, also, often coexist in the mouth and pharynx. On the vocal cords the rule is especially applicable that tuberculosis attacks the posterior, and syphilis the anterior, regions (Figs. 7 and 8).

Lupus in the larynx presents strong points of contrast with the usual forms of tuberculosis. It tends to spread from above downwards through the upper air-passages and attacks the epiglottis and upper aperture before it reaches the interior of the larynx; when the larynx is affected, active or healed lesions are often to be found in the nose, palate, or fauces. It differs from tuberculosis also in its painlessness, the nodular character of the infiltration, and the tendency to the production of dense scar tissue causing deformity and stenosis.

From malignant growths the diagnosis is not usually difficult, but a tuberculous infiltration limited to one vocal cord may imitate epithelioma very exactly. This form of tuberculous laryngitis is not very uncommon in elderly men; the patient comes for examination on account of hoarseness, there is often no suspicion of phthisis, the physical signs may be very indefinite or may appear to be those of a simple chronic bronchitis, and tubercle bacilli may be very scanty or absent. There is no doubt that a number of cases of this form of tuberculosis have been diagnosed and treated as epithelioma. An opaque white appearance of the infiltration is very suggestive of malignancy (Fig. 5), while signs of involvement of the other cord and slight arytenoid or interarytenoid swelling point to tuberculosis. Delayed or sluggish movement of the affected cord is a sign of malignancy, but we must never wait for this sign for, when it is apparent, the disease has extended deeply and the prospect of successful operation is much diminished. These lesions are often too sessile to permit the removal of a portion for biopsy, and this should not be done in any case unless operation has been agreed to, should the examination prove malignancy. These cases constitute some of the most anxious and responsible of laryngological problems. The patient should be given a very complete examination, including skiagraphy of the chest, and, if progress is slow, as it usually is, may safely be watched for several weeks; but it is better to perform a laryngo-fissure for an infiltration which proves to be tuberculous than to allow an epithelioma to pass beyond the reach of removal by this operation.

CLINICAL AND LABORATORY NOTES

PLACENTA PAPYRACEA AND FŒTUS PAPYRACEUS IN A BINOVULAR TWIN PREGNANCY

BY KENNETH MAY, M.B. LOND.
ASSISTANT MEDICAL OFFICER, LAMBETH HOSPITAL, LONDON

ON July 20th, 1931, a patient gave birth to a living child and to a mummified fœtus at Lambeth Hospital. She was a multiparous woman who had never had twins. Her mother had one twin pregnancy.

Pregnancy was uneventful and labour was normal. The living child was healthy and weighed 6 lb. 10 oz. On examination of the membranes a second placenta was noticed (Fig. 1 A). This was roughly circular, having a diameter of 9 cm. It was flattened and fibrous, and completely separated from the living placenta. Alongside this compressed placenta was a thickened area which gave a sensation of egg-shell crackling, and by radiography the fœtal skeleton was revealed (Fig. 2). When the amnion had been stripped away a fœtus of about 16 weeks' gestation was seen. Its general lie gave the impression that it had been spread-eagled. The skeleton was complete save for one humerus which was found in the membranes. The vault of the skull appeared to have burst open. The following measurements are approximate: diameter of placenta, 9 cm.; length of spine, 7 cm.; vertex to rump, 11 cm.; vertex to heels, 15 cm.; average width, 4 cm.; greatest thickness (scapular region) less than 1 cm.

The chief interest of this case lies in its rarity. G. C. Mosher,[1]

FIG. 1

FIG. 2

FIG. 1.—Photograph of the membranes, showing the flattened second placenta (A) and the fœtus. (B) is the jaw; (C) the spine; and (E) a leg of the fœtal skeleton.
FIG. 2.—Radiogram of the fœtus, for comparison.

[1] Amer. Jour. Obst., 1918, lxxviii., 288.

in 1918, was able to collect but 88 cases of fœtus papyraceus associated with a living twin from the literature of the preceding 80 or 90 years. Of interest too is the fact that this was a binovular pregnancy, as a mummified fœtus is said to be commoner with uniovular pregnancies (R. Birnbaum [2]).

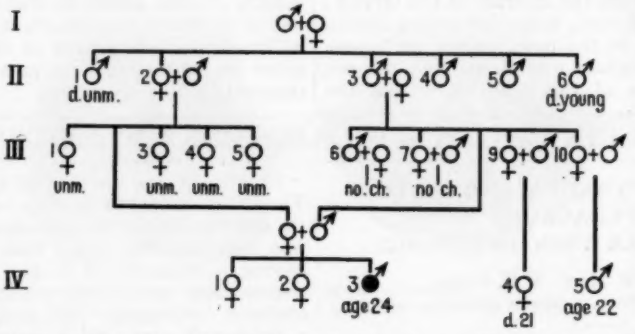
The mechanism of formation is as follows: death of one twin, retention, absorption of fluid, desiccation, compression by the growing twin. The factors influencing one placenta and twin to bring about their death are speculative. The cause of desiccation is also unknown, but its occurrence is presumably essential for retention of the fœtus.

I am indebted to Dr. G. F. Stebbing, who radiographed the specimen, and to Dr. T. McK. Robb, who photographed it and reproduced the radiograph.

A FORM OF BRACHYPHALANGY IN A COUSIN MARRIAGE

By R. Ruggles Gates, Ph.D., LL.D., F.R.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF LONDON

I chanced to observe recently a young man who appeared at first to be brachydactylous—i.e., with fingers having two instead of three phalanges, although his parents were normal. As this condition is always inherited as a Mendelian dominant, so far as known, the case was looked into further. The pedigree of this Warwickshire family is given in the accompanying figure.



The parents (III.2 and III.8), who were first cousins, as well as their son and daughter, were seen personally. The series of abnormalities in the son, who was 24 years of age and mentally bright, were quite unknown in any other member of this family through four generations. The second generation consisted of five sons and a daughter, number II.1 dying unmarried, while II.6 died young. The five daughters of II.2 all remained unmarried except III.2, mother of the proponent. From the marriage of II.3 to a normal woman there was a family of two sons and three daughters. The first son and daughter both married but had no children; III.8 was father of the proponent, III.9 had a daughter who died of pneumonia at 21, and III.10 has a son aged 22 years.

The abnormal son was the youngest of three children. IV.1 was apparently normal but died at birth owing to an abnormal presentation. IV.2, a daughter, is perfectly normal, and it now remains to describe the son. He was stout but dwarfed, about 4 ft. 7 in. in height.

Examination of his hands showed that, although his fingers were short and stubby, three phalanges were present in each finger. The basal phalanges were apparently of normal length, but the second and third phalanges were very short. The nails were very small on each finger, or in certain cases quite missing. The thumbs, however, were approximately normal, with large nails. Digit V on each hand was also rather strongly bent (crooked). He was also hexadactylous, a finger of probably full size, judging from the scar, having been removed from the ulnar side of each hand by surgical operation. Unfortunately it was not possible to make any more detailed examination nor to take radiograms. The feet were not examined, but there were stated to be five toes on each foot, with peculiarities similar to those of the fingers.

[2] Malformations of the Fœtus. Translation by G. Blacker. London, 1912, p. 20.

The inheritance of various kinds of short-finger abnormalities has been described elsewhere,[3] and the considerable recent literature of the subject has been reviewed by MacArthur and McCullough.[4] They describe a pedigree of "apical dystrophy" in which the first and second phalanges were more or less reduced or represented only by the epiphyses, and they point out differences between this condition and brachyphalangy, confining the latter term to those pedigrees in which there is absence or premature ossification of the epiphysis. The present condition resembles brachyphalangy in that the stature as well as the fingers are affected; but, on the other hand, the condition of the nails is like that found in apical dystrophy. Again, in previous pedigrees, the inheritance is that of a simple dominant, with rare cases of skipping a generation only in certain pedigrees, whereas in the present case the most probable interpretation is that the condition is a recessive brought out by cousin marriage.

Hexadactyly is also usually a dominant in inheritance, but in certain recent pedigrees it is clearly a recessive character in the Mendelian sense. The frequent association of two or more abnormalities in the same pedigree is of course well known. In MacArthur and McCullough's pedigree of apical dystrophy it was frequently associated with a variable condition of syndactyly and a well-marked tendency to doubling of the thumbs. The genetic evidence is as yet rarely sufficient to determine whether these conditions and their expression are due to genetically linked genes, the presence of modifying factors, or to single factors environmentally modified in their effects. On general genetic grounds, however, it seems highly probable that such conditions as hexadactyly and shortened phalanges are determined by separate genetic factors.

[3] Gates, R. Ruggles: Heredity in Man, London, 1929.
[4] MacArthur, J. W., and McCullough, E.: Human Biology, Baltimore, 1932, iv., 179.

The Manchester Hospitals.—A poll of the municipal electors was taken at Manchester recently upon an omnibus Bill promoted by the city corporation. Among the proposals defeated were those for requiring the pasteurisation of milk coming into the city, excluding Certified milk and Grade A milk, and for controlling the sale of food by street vendors. The one resolution that was carried was that which provides for the acquisition of land adjoining the Manchester Royal Infirmary which may in future be necessary for the extension of the institution. Even for this there was a majority of only 1180 out of a poll of more than 43,000.—At the recent annual meeting of the Manchester Victoria Memorial Jewish Hospital, Mr. Nathan Laskie, the chairman, claimed that "there was no hospital in the country comparable to it, and that everything known to modern science had been secured." The new theatre is fitted with an apparatus for providing artificial rain on the glass roof in hot weather. The department for paying patients is about to be opened. Cubicles will cost £3 and private rooms £6 per week, inclusive of everything except specialist's fees. "The rooms and meals," it is stated, "will compare with the finest hotels in the land." The extensions have cost £45,000. Last year the hospital spent £567 upon road accident patients, and received £121. Salford Royal Hospital spent £654 in the same way, and received £98.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTIONS OF NEUROLOGY AND PSYCHIATRY

AT a joint meeting of these two sections, held on Jan. 19th, the chair was taken by Dr. RISIEN RUSSELL, President of the section of neurology, and a discussion on the mental and physical symptoms of the

Presenile Dementias

was opened by Dr. MACDONALD CRITCHLEY. To the neurologist, he said, the presenile dementias were chiefly a problem of diagnosis. The majority of the deteriorations of late middle life were either syphilitic, arterio-sclerotic, or neoplastic. Smaller groups were the epileptic, the traumatic, and those associated with chronic neurological disorders, such as disseminated sclerosis and encephalitis. There remained a small group which could be separated by exclusion from all these: the true presenile dementias. The chief syndromes were Pick's disease and Alzheimer's disease. Pick had described his two cases in 1892; both had shown a curious psychical defect in life, and at autopsy a peculiar pathological change: symmetrical, localised, bilateral atrophies of the cortex. Only a few score cases had since been recorded. The onset was between the ages of 40 and 60, and females were more often affected than males. A phase of restlessness, agitation, and excitement was followed by dementia associated with focal symptoms, and finally by complete dementia and death. The course was usually slow. The focal manifestations were of all types, one of the commonest being sensory aphasia. Any part of the cortex might show atrophy, but the middle of the temporal lobe was the commonest site. The atrophy was a simple numerical reduction in the total number of cells, particularly in the three upper layers. The remaining cells showed some changes, notably a deposition of iron. The changes were not those of old brains, and did not resemble those of senile dementia. The ætiology was quite unknown. There was nearly always a family history of psychosis.

Alzheimer had described his disease in 1906; it appeared to be a little more common. The symptoms resembled those of Pick's disease, but the course was rather longer. Epilepsy was important. Remissions might occur. The pathological changes were like those of senile dementia, but much more intense and diffuse. "Alzheimer's tangle" appeared in other diseases as well as this. Senile plaques were very common. This condition might be a premature senility or a toxic phenomenon. Probably Alzheimer's and Pick's diseases were less rare than was believed. Diagnosis during life could only be made by exclusion; it was doubtful if the differential diagnosis could be made, except on the family history. Pick's disease had been demonstrated by encephalography, but the method was not to be recommended. The physical signs of the presenile dementias had received little attention, but careful examination would reveal interesting signs in the nervous system. The focal manifestations were extremely varied, as projection, commissural, and association fibres might be implicated. Other signs often present could not be correlated with precise lesions; these were the psychomotor disorders. The two chief types were the hypokinetic (immobility resembling Parkinsonism, slowness, resistance amounting to hypotonus and katatonia) and the hyperkinetic (restlessness and agitation, bizarre repetitive movements, grasping movements, and conveying everything to the mouth).

Dr. R. D. GILLESPIE offered a similar classification into (1) simple presenile dementias, (2) Alzheimer's disease, (3) Pick's disease, (4) presbyophrenia, and (5) the other conditions described by Kraepelin. He said that the subject had received inadequate attention. The histopathological changes found were too variable to form a basis for classification. The psychiatrist saw little of Alzheimer's and Pick's diseases outside institutions because the patients went to the neurologist as suspected intracranial tumour. A progressive failure of intellect and interest was the fundamental symptom of the simple group, and on this secondary intellectual, affective and conduct disorders might be superimposed. Symptoms on the symbolic level were important in differentiation. In the first group the intellectual symptoms persisted alone for some years. This group might be merely the early stage of one or other of the subsequent groups. On the whole, however, Dr. Gillespie thought there was a real group of this kind, as he had known the symptoms last for four or five years without any focal manifestations. The onset was so insidious that recognition was difficult at first. Slight deterioration and behaviour changes might set in as early as the late 'thirties. Little was known of the ætiology of any of the conditions; and there were no specific histopathological changes. Alzheimer's fibrillary changes, senile plaques, and Simchowic's granulo-vascular degeneration might be found in any group. There seemed to be a racial incidence.

Presbyophrenia was a confused concept, the term being differently used by different authors. According to one author, the leading symptom was a memory defect with confabulation, but for Bleuler the condition was equivalent to Alzheimer's disease. Kraepelin placed it among the senile dementias, and doubted whether it was a separate entity. The term could conveniently be retained for patients with retention defect and confabulation, but continued intellectual ability.

Dr. T. R. HILL selected only those dementias characteristic of the age-period 40-60, excluding late dementia præcox, gross organic disease, general paralysis, and toxic cases. There remained a number of types of dementia, chiefly falling into two groups: those associated with neurone degeneration, and those following cerebral vascular changes. These two might be compared with parenchymatous and interstitial syphilis. The first group included Alzheimer's and Pick's diseases, presbyophrenia, and early senile dementia. It was doubtful if there was any clearly defined condition to which the term "presbyophrenia" could be applied, unless it were to some anomalous cases of senile dementia. Alzheimer's disease had been described between the ages of 30 and 40, and once in childhood. Its average duration was four and a half years, but cases had been known to last 20 years. The definite familial incidence noted in Pick's disease had not been seen in Alzheimer's. Despite the uniform clinical picture, there was considerable individual variation. Aphasia, apraxia, and visual agnosia were less prominent and early than in Pick's disease. An incessant busyness seemed to fill the clinical picture at one stage. Positive symptoms were most marked, whereas in Pick's disease the negative symptoms were outstanding: inertness, lack of interest, and complacency. The course in Pick's disease was usually two to three years, though some

cases had lasted 15 years. The one rule that seemed to regulate the focal atrophies was that the pre- and post-central and visuo-sensory areas should always be spared. Certain groups of cells seemed predestined to pathological change.

Arterio-sclerotic dementia was much commoner and more chronic. Focal symptoms were multiple, the aphasia being of sudden onset and sometimes transient. Insight was well preserved. The Pick's or Alzheimer's disease was brought to the doctor; the cerebro-arterio-sclerotic came himself, gave a clear account of his disease, and was anxious. Moreover, the nucleus of the personality was well preserved, but in Pick's or Alzheimer's disease it was profoundly shaken.

DISCUSSION

Dr. H. H. DEVINE said that restlessness in these cases might be due to bewilderment as a result of not being understood. When they were given a good environment their restlessness disappeared. It was a matter of very interesting speculation how much mind these patients had and to what extent they appreciated the environment, but were unable to express themselves.

Sir ROBERT ARMSTRONG-JONES spoke of the social and family aspect of the problem. Cases of this kind were often not certified, but their affairs were placed in the hands of a receiver. The ordinary senile deterioration might be said to become pathological if there was marked loss of memory, marked change in personal habits or conduct, purposeless restlessness, or extreme fatuity and lethargy, or if there was a growing antipathy towards those formerly near and dear. The changes depended on the inherent durability of the neurone. It was doubtful if any form of insanity proper especially characterised senility, but the dementia of old age was quite characteristic. There was a slurred activity of thought, a diminished receptivity, and marked confusion, especially about relations. Old people often suspected those about them of plotting to rob them, and undesirable but plausible people were trusted instead of old friends. Here the protection of the Master in Lunacy was of inestimable value to the family. These people should not be allowed to make wills without the consent of the Master. Some of the symptoms related to the sexual instincts, the moral faculties being the first to go, and the cases might come before the courts. The commonest associated symptom was urinary trouble, often ending in fatal cystitis or pyelitis.

Dr. G. W. B. JAMES related some case-histories of Alzheimer's disease. One woman had died after three and a half years. Three brothers had already died of the disorder, and the father had almost certainly had Pick's disease. The mother had died of cerebral hæmorrhage. An increasing number of patients in the presenium was seen with anxiety, inability to concentrate, fear of new situations, and an apparent dementia. These people had not previously suffered from anxiety.

Dr. R. M. STEWART said that the most striking feature of Pick's disease was the gross naked-eye change, and yet microscopically the change was limited to the supragranular cortex. Similar histological changes in aments did not produce such a gross modification. Atrophy of the corpus callosum might play a part in producing the physical signs.

Dr. LETITIA FAIRFIELD remarked on the rise of the suicide rate in both sexes between 45 and 55. This gave a serious aspect to mental symptoms at this age. She would like to know the connexion between the mental symptoms and the endocrine changes of the period. Clinically it was important to know how much to attribute to mental changes, and how much to temporary disturbances that would right themselves.

Dr. CRITCHLEY, in reply, said that the familial incidence of Alzheimer's disease had not been recognised. Alleged cases in young persons were probably something else. The more demented an old person was the more likely were senile plaques to be found, but their significance was still far from clear. The absence of radial or even retinal arterio-sclerosis did not exclude cerebral arterio-sclerosis, and this was by far the commonest cause of presenile dementia. Remissions and emotivity indicated arterio-sclerotic dementia. He had seen a case of Pick's disease with extreme precentral atrophy.

Dr. GILLESPIE, also in reply, agreed with Sir Robert Armstrong-Jones that the importance of diagnosis lay on the legal side.

Dr. HILL regarded the restlessness of Pick's disease as a loss of inhibition, the pathological process being less intense than in Alzheimer's disease. Any case which from the start had no insight was probably not arterio-sclerotic.

SECTION OF PHYSICAL MEDICINE

AT a meeting of this section on Jan. 20th, with Sir ROBERT STANTON WOODS, the President, in the chair, a discussion took place on

Physical Methods in the Treatment of Heart Disease

Dr. F. G. THOMSON (Bath) said that although during the last ten years more attention had been paid to physical medicine, comparatively little had been given to its application to heart disease; indeed, physical methods seemed to have been in use more 25 years ago—chiefly in the form of effervescing baths, resistance exercises, and the like, as carried out at Nauheim. The vogue of Nauheim received a check from some devastating criticisms by the late Sir James Mackenzie. The speaker felt, however, that much more should be done by physical means for heart disease which in this country accounted for more deaths than any other disorder. With one or two exceptions, drugs had only a limited value in these disorders. Rest, duly regulated exercise, changes of environment, and, as far as possible, freedom from anxiety were all very important.

To estimate the true value of any therapeutic procedure, it was first necessary to consider its physiological effects on the normal person. Though the effect of baths on the heart was indirect it was very real, since the cutaneous and subcutaneous vessels contained at any one time a large proportion of the total body content of blood, and this superficial blood stream was readily influenced. With certain forms of bath the main effect was an active capillary dilatation, and an increased blood flow, with a desirable readjustment of pressure. The reflex result of this on the heart was to slow the beat and increase its propulsive force. If this bathing was combined with the drinking of appropriate waters the benefit might be increased. One effect was to reduce obesity, and hasten oxidation and elimination of waste products. Should any arterial spasm be present, this was much relieved or overcome by the baths. Similarly, the tone and quality of the heart muscle was increased. Electrotherapy seemed to be of but limited applicability to cardiac cases; indeed, the only form of electrical treatment which he had

found to be of real value was that originally advocated by Sir Clifford Allbutt, the high-frequency current, which that authority advocated for abnormally high blood pressure.

It was necessary to exclude from this treatment all cases of malignant endocarditis, however chronic or apparently latent; also all cases of recent rheumatic carditis. Old rheumatic heart affection which had become stabilised with time and in which there was a non-progressive mitral lesion was not necessarily precluded as unsuitable for physical methods if the myocardial state suggested the desirability of treatment on those lines; but he would not so treat cases having advanced myocardial disease, especially if there was concomitant renal disease. Indeed, in a general way, any case with a rheumatic history or having an obvious rheumatic lesion should be viewed with suspicion from the point of view of physical treatment. One must also rule out cases of advanced arterio-sclerosis, especially if the patient's condition suggested that there might be any vascular cerebral lesion. Another reason for exclusion was tachycardia when associated with hyperthyroidism.

Among conditions suitable for physical methods were, firstly, cases which were recovering from a toxic myocarditis which had followed on such an illness as influenza or tonsillitis, this toxin having definitely debilitated the heart muscle. He thought that the importance of infection in causing cardiac disability was not always sufficiently recognised. Another class of suitable case was the so-called D.A.H. (disordered action of the heart), the case of tachycardia which showed an exaggerated reaction to exertion, the case which showed the "effort syndrome." Next he mentioned functional conditions, as when extrasystoles were noted, and also dyspnœa due to gastro-intestinal disorders. The commonest of these latter were constipation and dyspepsia, possibly associated with chronic appendicitis or cholecystitis. Most of these patients showed, also, a heightened sensitivity, bordering on neurosis. Cases of myocardial debility and obesity were suitable for treatment by physical methods. And early cases of myocardial degeneration, which often were associated with hyperpiesis and symptoms suggestive of coronary insufficiency, were also very suitable.

A class of case in which spa and physical treatment was especially valuable was that showing chronic myocardial degeneration in an early stage. He instanced the case of the average middle-aged man who began to get somewhat breathless on exertion and said he felt a tightness across his chest when walking briskly uphill. He probably still ate heartily, and took less exercise than he should, and the veins on his face became prominent. The heart might be somewhat enlarged, and the aortic sound had an ominous ring, with a raised blood pressure. If untreated, such a man would go on to develop an irremediable form of myocardial degeneration. Almost certainly his metabolism was defective. Then oncoming obesity imposed a further serious handicap. Obesity was always a disability at this stage of life; it was said that in the obese the mortality from heart disease was two and a half times that among ordinary non-obese people. Once the coronary vessels and the myocardium had become the seat of advanced degeneration, no form of treatment could be of real benefit. This fact emphasised the lesson that treatment should be instituted as early as possible.

DISCUSSION

Dr. B. T. PARSONS-SMITH said it was usual to divide heart affections into two main groups—functional and structural or organic. In both kinds there was defective circulatory reserve; the circulatory mechanism of the heart suffered embarrassment, so that the train of symptoms known as the effort syndrome resulted. He considered that general massage and graduated exercises were very important in cases of heart affection. These increased the strength of the myocardium and improved the mechanism of the general circulation. Both, however, must be administered with great caution, and after careful examination of the patient. Whenever possible, results should be checked by tests of exercise tolerance. Great benefit sometimes followed deep breathing at the rate of seven or eight breaths per minute, for ten minutes at a time. Following this, he had noted a definite increase in the "R" wave on the electrocardiogram. Certainly deep breathing exercises had an improving influence on the mechanics of the circulation, as the auricular efficiency was enhanced, and in mitral stenosis the auricular waves were increased in voltage by this means.

Dr. T. F. COTTON referred to the discordant views held as to the effect of digitalis in cases of heart failure with a normal rhythm, and the important place which physical treatment held in cardio-vascular conditions, deaths from which, recent statistics showed, were on the increase. Of all diseases of the circulatory system the most common was hypertensive heart disease, including arterio-sclerosis. It was important to consider particularly the cutaneous blood-vessels and their response to mechanical, thermal, and electrical stimuli. The essential vascular defect was usually structural, and a contributory cause was arterial spasm, and, often, a vasoconstriction from vasomotor influences. Following the action of the stimuli mentioned it seemed clear that a release of diffusible vasodilator substance took place. Even with intense diathermy the degree of heat penetration was but slight, and experience showed that electricity was not effective in controlling anginal pain. If it was sought to record the end-results of physiotherapeutic treatment in terms of blood pressure, not many therapeutic triumphs would be handed down. The relief of symptoms was not always dependent on the control of pathological processes.

Dr. GEOFFREY HOLMES (Harrogate) said his experience had been mainly in the treatment of heart disease by balneological methods. In some other diseases the heart condition was such that considerable judgment was required in modifying the bath treatment to suit it. In association with rheumatic conditions the vascular states fell into two groups: (1) valvular disease; (2) myocardial weakness and anæmia associated with the chronic infective types of arthritis. Sometimes one of these supervened on the other. The heart condition of a patient might be so poor that the bath treatment appropriate to his joints was impossible because of the state of his heart. In bath treatment much had to be left to the actual technician, and knowledge as to the amount of bath to give for certain states was only gradually being acquired. Following a short bath of a temperature of 99° to 104° F. there was an immediate rise in the systolic pressure, but, almost always, an increasing drop in the diastolic pressure. Even in the case of the normal person, indulging in a hot bath produced profound changes in the

heart's action. The principal kinds he used were immersion baths, massage baths, packs, and poultices. Carbon dioxide baths definitely affected the basal metabolism, caused an increased flow of blood through the peripheral vessels and so relieved the heart. For some time he had been using sulphur baths aerated with CO_2. He considered the most important test of results to be the exercise tolerance; if this was improving there was little need to trouble about the blood pressure readings. He also was a believer in mustard liver packs for auricular fibrillation. These physical methods did not interfere with digitalis and other drug treatment of the patient, and a combination of the administration of vasodilators and physical methods was better than using either separately.

Dr. W. P. KENNEDY said that deep inspiration prolonged diastole and increased the tone of the cardiac muscle, and a sequel of this was to stimulate the pulmonary venous flow, and to dilate the infundibular vessels.

Dr. R. TIMBERG said that in Sweden 50 years ago physiotherapeutic measures were largely practised. At about that date, Swedish people lived more well than wisely, and their comparative lack of exercise brought about a great prevalence of obesity. Physical methods beneficially influenced the systemic, particularly the pulmonary and the portal circulation. It was possible to regulate the heart to a great extent by stimulating the vagus. In his practice he attached great importance to deep breathing.

SECTIONS OF RADIOLOGY AND OBSTETRICS

A JOINT meeting of these sections on Jan 20th, with Dr. RUSSELL REYNOLDS, President of the section of radiology, in the chair, was devoted to a discussion on the

Radiotherapy of Non-malignant Gynæcological Conditions

Dr. N. S. FINZI said that irradiation treatment of menopausal menorrhagia in patients over 38 was so certain that surgery was unjustifiable, in view of its increased risk and the long convalescence required. X rays and radium were equally effective; X rays were easier for the patient, especially if spread over three months, as in his own technique, but the result with radium was quicker. Examination under anæsthesia and diagnostic curettage were often advisable. The dose of radium used was 50 mg. in a 2·0 mm. platinum filter for 48 hours. In treating patients under 38 for menorrhagia there was a danger of menstruation returning, and if pregnancy occurred the fœtus might be deformed, microcephaly being the commonest abnormality. Small doses of X rays might be used for restoring normal menstruation in young patients. X rays could be used in uncomplicated cases of fibroids, with patients over 38, even when the uterus was very large; he had successfully treated one case in which the uterus was up to the ensiform cartilage. Younger patients with severe heart disease or anæmia were also suitable subjects if surgery was contra-indicated. Radium might be used in similar cases, especially when examination under anæsthesia was advisable. Surgery was indicated where the patient was under 38, where the fibroids were degenerate or calcified, subperitoneal pedunculated, completely or partially polypoid, or purulent or gangrenous, or where there were pyosalpinx or old tubo-ovarian inflammation, malignant degeneration, or severe compression symptoms. For endometrioma full doses were necessary; deep X ray treatment should be given as for carcinoma. Cases of pelvic inflammation responded to very small doses of penetrating X rays.

Mr. MALCOLM DONALDSON said that in uterine hæmorrhage examination under anæsthesia was essential, except in cases of pure menorrhagia, which might be treated by X rays. He emphasised the necessity of educating the public to appreciate the importance of an exact diagnosis made by curettage in cases of excessive or irregular menopausal hæmorrhage. In favour of X rays was the absence of an anæsthetic and lying-up. Under anæsthesia carcinoma and inflammatory conditions could be excluded, and radium was then preferable. In addition, application of radium to the cervix might be found to diminish the incidence of carcinoma. This was supported by experiments on the production of tar cancer in normal and irradiated animals. Fibroids might be treated by radium or X rays if the uterus was not much larger than a fœtal head, subject to the contra-indications mentioned already. Some fibroids remained the same size and some diminished, the result probably depending on the amount of muscle present. The effect of irradiation was definitely on both ovary and uterus. Small doses of radiations were beneficial in tuberculosis of the cervix or vagina. In women under 40 the treatment of irregular hæmorrhage and menorrhagia by radiological methods was very rarely advisable.

Dr. F. HERNAMAN-JOHNSON said that X rays probably also prevented carcinoma. Radium was more liable to cause vomiting and upset the patient. Women were more likely to come for treatment if they know it can be given without an anæsthetic. X rays very seldom failed in women over 40. Menopausal symptoms were not worse than at the normal menopause, and sex-life appeared to be unaltered.

Mr. NORMAN WHITE gave the results of 323 cases treated with radium at University College Hospital. The most satisfactory dose to produce amenorrhœa, he said, was 50 mg. for 60 hours, with screenage equivalent to 1·5 mm. platinum. Patients under 35 were rarely suitable for radium treatment; there was only a 50 per cent. chance of decreasing the loss at the periods, short of causing permanent amenorrhœa. The menopause in young patients was liable to be associated with severe neurasthenia, and three cases of mild Graves's disease had occurred among eleven cases of radium menopause under the age of 35. Radium treatment seemed to be without risk when used in suitable cases. No case of carcinoma of the uterus had been found after radium treatment in this series.

Miss B. E. TURNER quoted statistics of 55 cases treated at the Royal Free Hospital.

Dame LOUISE MCILROY said that curettage and microscopical examination of curettings were essential when radiological treatment was undertaken for uterine hæmorrhage. Radiologists should try to find a method of diminishing menstrual loss without producing amenorrhœa.

Dr. ELIZABETH HURDON said that 96 per cent. of cases of menorrhagia were cured by small doses of radium and she did not think large doses should be given as a routine; the treatment could be repeated in the few cases of failure.

The CHAIRMAN emphasised the necessity of stating what screen was used in radium treatment. He drew attention to the fact that after treatment the patient commonly had an excessive period, and this was no indication that the treatment had failed.

MEDICAL SOCIETY OF LONDON.

Anæsthesia During Labour

AT a meeting of this society on Jan. 23rd, Sir JOHN BROADBENT, the President, was in the chair, and a discussion took place on anæsthesia during labour.

THE GYNÆCOLOGIST'S POINT OF VIEW

Mr. LESLIE H. W. WILLIAMS said that labour was painful for many hours, particularly so at two periods: (1) when the first stage was just completed and the head was beginning to distend the vagina; (2) at the time of delivery through the vulva. For the relief of pain, therefore, something was needed which would act over a long period and could be reinforced at will. The ideal means of relieving the pain of labour still remained to be discovered. Admittedly gas-and-oxygen was the best anæsthetic for the last two or three hours of childbirth, but efforts were still being made to find a drug more powerful than chloral and bromide for the first stage. Some patients became wildly excited, even maniacal, under some of the vaunted new drugs, and exhibited other signs of poisoning, while others seemed to have little relief from pain. In recent years gas-and-oxygen had been widely advocated, especially by anæsthetists, but they were considering only the second stage, since this anæsthetic could not serve throughout labour.

The method practised by *Gwathmey*, of which Mr. Williams's own experience was very slight, seemed to have great possibilities.

As soon as the patient began to show real distress, gr. 1/6 of morphia dissolved in 2 c.cm. of a 50 per cent. magnesium sulphate solution was given intramuscularly, and during the first stage two further injections of the mag. sulph. solution were given alone; this deepened and prolonged the action of the morphia. Just before the descent of the head into the pelvic brim, rectal injection of a mixture consisting of ether and olive oil, with a small amount of quinine and alcohol, was given. Sometimes a smaller dose of this mixture could be given later.

The method seemed to merit a much more extensive trial in this country.

Twilight sleep deserved a wider use. Its employment was fairly usual in maternity hospitals for inert uterus or excessive first-stage pains with but little dilatation of the cervix. All Mr. Williams's private cases were given some modification of twilight sleep. The following was a modified scheme of administration of scopolamine and morphia which had undoubted value.

At the first sign of distress the mother was given gr. ¼ of morphia and gr. 1/100 of scopolamine, and she subsequently received gr. 1/200 scopolamine at two-hourly intervals for two days, and later gr. 1/300 at three-hourly intervals if required. This treatment could be maintained until the actual expulsion of the child, but his own practice was to stop the scopolamine at the beginning of the scond stage and continue with intermittent chloroform, gas-and-oxygen being, however, even better.

It was important, in every case so treated, to ensure that the woman was not left alone; the obstetrician should be present, if possible, the whole time, and a nurse must always be at hand to relieve thirst. Occasionally patients so treated became hysterical, even maniacal, and when that occurred the scopolamine must be stopped. A further disadvantage was that some of the children born under this régime were in some degree asphyxiated. This asphyxiation, however, did not last long if careful provision of an airway was made.

The use of the *barbiturate* preparations by the intravenous route he considered inapplicable in obstetrics, since, apart from their well-known dangers, the duration of their analgesia was not sufficient. Nor did he like drugs, like avertin, per rectum, not only because their retention was difficult, but because their use militated against a clean confinement. Barbiturates given by the mouth showed an extraordinary variability of effect. Nembutal was now put up in grs. 1½ capsules, sodium amytal in grs. 3 capsules. He had frequently given 7 or 8 capsules in the course of a labour. The maximum safe dose, however, was considered to be 4 capsules. Another method was to give nembutal and chloral hydrate, but he had not observed advantage from this in his practice. However well nembutal may have acted in the early stages of labour, some other anæsthetic needed to be added for the second stage.

For this second stage *gas-and-oxygen* was far and away the best, as it had no adverse effect on the uterine contractions, and the baby was never affected. Second in value at this stage he placed *chloroform* when the foregoing was not available, and often it was not because of the cumbersome apparatus necessary for its administration. By means of a Junker apparatus the nurse could keep the patient in a state in which she was unconscious of any suffering. Chloroform could also be administered on an open mask or by means of 20 minim capsules (Brisettes), which were crushed and slipped inside the lint covering the ordinary anæsthetic mask. Six to ten of these capsules were used in the course of an hour. In operations for the actual extraction of the child the anæsthesia should be allowed to diminish to as light a degree as possible, so as to permit of the resumption of the uterine contractions.

THE ANÆSTHETIST'S POINT OF VIEW

Dr. DOUGLAS BELFRAGE said that he would speak only of those methods of which he had had personal experience. For the second, expulsive, period of labour the choice must be made from the anæsthetic drugs in general use: ether, chloroform, and gas-and-oxygen. The latter was the only one which fully answered the requirement of abolishing pain without interfering with the uterus or injuring the child. The other two—especially chloroform—inhibited the uterine muscle when used in sufficient concentration adequately to relieve pain. The objection to gas-and-oxygen anæsthesia was the cumbersome apparatus; efforts were now being made to greatly lessen this disadvantage, and apparatus weighing not more than 50 lb. had been constructed.

It was more difficult to secure to the woman a first stage free from pain. Theoretically this could be done either by making sure she felt no pain, or by ensuring that she remembered nothing of it afterwards. He considered that in this stage morphine, omnopon, and scopolamine had stood the test, also the barbitones and avertin. Morphine-scopolamine and omnopon-scopolamine he believed had now settled into their place in the anæsthesia of labour. The dangers and disadvantages of prolonged twilight sleep were now well recognised. Of pernocton he had had an unfortunate experience because of the amount of restraint the patients required, though their complete obliviousness of what had transpired was unquestionable. Nembutal he regarded as a perfectly safe drug when rightly handled. When used alone, even when morphia had been given beforehand, there was considerable restlessness and struggling, but if O'Sullivan and Craner's technique was followed this tendency was almost absent. The first dose consisted of grs. 3 of nembutal, followed ten minutes later by grs. 30

chloral hydrate in lemonade, the drink being taken very slowly, otherwise vomiting might ensue. Two hours later nembutal grs. 1½ and a like quantity of chloral hydrate was given. Usually the labour had proceeded almost to the end by the time the second dose had been acting for an hour or so, so that the administration of gas-and-oxygen or chloroform for a short time was all that was needed. He had not noted, when using this means, that labour had been protracted particularly, nor had any of the babies been born with dangerous asphyxia. Among the chief drawbacks were the great variation in the action of the nembutal as between patient and patient, and the tendency to sickness of the mother. Avertin had its place in obstetrics; its action was the same as when it was used as a pre-operative narcotic and as safe, provided that the patient was not left alone. The dose for obstetrics should be three-quarters of the pre-operative dose, and should be given to primiparæ when the cervix was three-quarters to fully dilated, and to multiparæ at about half the full dilatation. In 20 cases he had had no difficulty about the rectal administration or retention of avertin. He had not met anyone who had had personal experience of the Gwathmey method.

THE PRACTITIONER'S POINT OF VIEW

Dr. GLYN HUGHES discussed the relative merits of the various forms of anæsthesia used in labour from the standpoint of the general practitioner, especially in view of the fact that half the labours of the country were conducted by midwives. It was necessary to differentiate between practitioners working in London and those practising in out-of-the-way country districts. He did not advocate twilight sleep, as constant attention and supervision were required, and the child might be born apnœic. But the modified method of giving smaller doses of morphia and scopolamine as a preliminary sedative could be very helpful. Pernocton and nembutal were uncertain in their effects, especially when given by the mouth, the only practicable method in obstetrics. Moreover their use was always followed by some degree of restlessness, which might be a serious handicap, and certainly wearied the patient and diminished the patient's expelling power. This restlessness could be to some extent diminished by giving beforehand an injection of omnopon and scopolamine. To have a child born in a condition of apnœa was always a worry to the practitioner. The difficulty in regard to paraldehyde was one of rectal retention; it was necessary to hold the buttocks together, a difficult matter in labour. Avertin he had never used in obstetric practice; its action was too short-lived to be of value to the general practitioner. He agreed that all the drugs mentioned might be useful in institutions. Gas-and-oxygen was of immense value, but was difficult to administer. Dr. Hughes was wholly in favour of chloroform as against ether, except where contra-indicated, as in toxæmia, hæmorrhage, and exophthalmic goitre. Ether introduced the risk of bronchitis. Chloroform was particularly suitable for women who clamoured for some form of anæsthesia from the start. Sleep and rest were a valuable preliminary to labour, and did much to prevent uterine inertia, shock, and post-partum hæmorrhage.

A FOOL-PROOF JUNKER

Dr. Z. MENNELL remarked that the expert obstetrician, the expert anæsthetist, and the general practitioner had been heard in the discussion, but not the midwife. Granted that gas-and-oxygen was the ideal anæsthetic for labour, the ideal was unattainable in this country under existing circumstances. The result of a long experience in both practice and teaching was that chloroform, given to the obstetrical degree in normal labour, was the only feasible anæsthetic. It was a matter of general agreement that every effort should be made to ease the suffering associated with labour and to help the women at least to forget what they had gone through. By normal labour he meant one in which there was reasonable hope that the woman would deliver herself unaided; and by chloroform anæsthesia to an obstetrical degree he meant a light anæsthesia, really an analgesia, causing only partial amnesia. And it should be intermittent. The degree of anæsthesia should be deepened slightly at the end. He did not think the barbiturates were to be recommended in this class of work. Twilight sleep had been tried out in a long series of cases at St. Thomas's, and all he would say about it was that hyoscine and morphia had their uses. Avertin he regarded as too uncertain to be useful, and if rectal anæsthesia was needed, some safer drug should be chosen. The synergistic anæsthesia, or Gwathmey method, seemed to him to be complicated. He considered that paraldehyde, freshly mixed and given per rectum, was one of the safest of analgesics; it greatly aided the earlier stages of labour and rendered the use of chloroform easier; it was not necessary to use large doses. Recently there had been talk of capsules of chloroform being issued to midwives, and in this he saw possible danger; it should be possible to produce a fool-proof Junker inhaler, and he showed one which he had nearly completed, which it was proposed to register. He thought candidates for the C.M.B. certificate should be required to show familiarity with it. Anæsthetists should face the fact that a large number of patients were delivered single-handed, and set to work to determine the safest form of analgesia. His own preference was for paraldehyde, with or without chloroform vapour from a Junker.

THE NEED FOR CAUTION

Sir WILLIAM WILLCOX warned the profession with regard to the use of certain drugs for producing anæsthesia, whether during labour or otherwise. Nembutal was a new drug, and the dangers of its use only became known after bitter experience. It was the most powerful of the barbituric acid group, from the toxic point of view, exceeding considerably the toxic power of luminal. Nembutal poisoned the kidney cells, stopped their secretion, and in consequence suppression of urine might occur. He knew of four cases of such suppression following its use which ended fatally, though the doses were smaller than those mentioned by Mr. Leslie Williams. Considerable hesitation was necessary before nurses were entrusted with a drug of such potency. Drugs of this class killed by causing what was known as veronal pneumonia, which he had described in 1913. No practitioner could keep abreast of the chemical and biochemical advances constantly going on, and he had to rely on information received through reputable channels; and the need for caution was all the greater in view of the large number of manufactured emanations for which many virtues were claimed. Sir William agreed with the principles laid down by Dr. Mennell, and urged the need to remember that a small dose could be doubled at will, but a big dose could not afterwards be withdrawn; gr. 1/6 of morphia and gr. 1/200 of scopolamine would harm no one.

Mr. J. P. HEDLEY agreed that, within limits, the less drugs the woman in labour was given the better. Paraldehyde was a safe drug to use. He was in accord with all that had been said concerning chloroform.

Dr. B. SCHLESINGER asked what method of anæsthesia in labour left the infant at its best; was not nembutal liable to leave the child cyanosed? Was chloroform safe for the infant?

Mr. D. M. ROY said that if one restrained a patient to whom nembutal had been given it was evident that the whole musculature was working. He assumed that when so much muscular energy was being expended there could not be the needed concentration on the expulsion of the child. It seemed a pity to use any method of inducing analgesia which minimised or did away with the coöperation of the woman; it should be possible to dull her pain without destroying her consciousness. Admittedly some women wished to be oblivious of the whole proceeding, but others preferred to know what was going forward.

Dr. JENNER HOSKIN asked whether any modification of anæsthesia had been devised to suit mothers with damaged hearts who were passing through labour—i.e., mitral stenosis without definite failure.

Mr. W. MCKIM MCCULLAGH said he was attached to a hospital at which 1600 deliveries were effected per annum, and all the various anæsthetics had been tried there. In the last five years the only death from anæsthesia was in a patient who was given chloroform, death resulting from atrophy of the liver. Morphia and magnesium sulphate has been tried, and no effect was traced to the magnesium sulphate.

Mr. W. GILLIATT did not think it would be denied that all anæsthetics delayed the uterine contractions. It was not wise to lead every mother to believe she would pass through a painless labour; rather she should be told it would be accompanied by pain, but that efforts would be made to lessen it. Then it would not be necessary to drug her throughout the labour. He had had no ill-effects from nembutal and chloral; there was an absence of excitement in the mother and of disquieting symptoms in the baby.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE

Bacteriophage

Dr. G. CARMICHAEL LOW, the President, took the chair at a meeting of this society held at Manson House on Jan. 19th, when Dr. F. M. BURNET read a paper on recent work on the Biological Nature of Bacteriophages.

He said that the active agent was particulate and varied considerably in size—between 10 and 60 μ—though the particles of a given phage were nearly always uniform in size, and the size was independent of the organism on which the phage was grown. The rate of inactivation by heat changed with the temperature in a fashion characteristic of the heat denaturation of proteins. The influence on heat inactivation of solutions containing different proportions of bivalent and monovalent kations indicated that the surface condition of phage was similar to that of bacteria and other living organisms, and that phages, even when purified by the elimination of bacterial antigens, were capable of inducing the formation of specific antibodies. All the evidence was therefore compatible with the view that the phage particles were definitely organised bodies reproducing themselves true to type, and largely composed of protein. Some of the large-particle phages strikingly resembled minute bacteria in their behaviour. True agglutination of washed phage particles could take place; non-multiplying bacteria could be coated with phage and then agglutinated specifically with anti-phage serum, and in the course of phage multiplication a specific soluble substance was produced which was separable from the phage particles by ultra-filtration, and could also react with the specific antibody of the phage serum. The problems of lysogenicity had great theoretical interest. Certain quite characteristic bacterial strains could, by certain manipulations, be used to induce typical lysis either of the homologous strain or of another. Apparently normal strains of coliform bacteria had regularly produced a phage lysing Shiga-dysentery cultures. Lysogenicity had been found surprisingly common in salmonella cultures, and a large number of phage types could be obtained from cultures of a single species. Lysogenicity was not an essential characteristic of the species. The relationship demonstrated could only exist between two sets of biological entities when their evolution and differentiation had been essentially independent. In other words, the phenomena of lysogenicity indicated that bacteriophage formed a group of independently evolved living organisms capable of entering into parasitic or symbiotic relationships with bacteria. Dr. Burnet concluded, therefore, that bacteriophages were independent micro-organisms, viruses which were obligate parasites or symbionts of bacteria. He suggested a classification according to particle or plaque size, serological character, and resistance type.

Colonel F. P. MACKIE showed slides illustrating the methods in use in Bihar and Orissa and in Assam for the isolation and standardisation of bacteriophages, and for the detection and typing of natural and unknown phages by testing them against a series of phage cultures of different specific resistance. A large number of strains recovered from sewage or from patients towards the end of a cholera epidemic were found to be A-resistant; it was also known that the A phages had the power of changing a smooth vibrio into a rough one, and of reducing or abolishing the agglutinability of that vibrio. In other words, they could change a normally agglutinable cholera vibrio into one which had hitherto been regarded as a water- or non-cholera vibrio. One authority went so far as to say that not only would A phages urn a normal cholera vibrio into an unagglutinable one, but that B and C phages had the power to turn it back again to a pure normal bacterial culture of cholera vibrio. If that were true, immunologists had to combat not only the cholera vibrio, but also those phages which had the power of reconverting it from a harmless to a harmful organism. The observation, however, had still to be confirmed.

Prof. J. C. G. LEDINGHAM criticised Dr. Burnet's theory. He knew of no crucial experiment that would prove it. Prof. J. Bordet had welcomed Dr. Burnet's work as supporting his own view that the phage was a manifestation of transmissible autolysis. Prof. Bordet had laid stress on the lysogenic properties in his Croonian lecture a year and a half ago, and had said that it was very difficult to eradicate them. On Dr. Burnet's showing the organism must have a virus, and possibly two or three viruses, associated

with it. Prof. Ledingham found this difficult to believe, especially as it had been shown that the organism suffered no harm whatever. As the phage was an independent organism, it was difficult to see why various salmonella organisms were associated with specific phages, instead of the association being dictated by chance. The speaker considered that the salmonella organisms were closely related antigenetically, and that the variation in their phage content might be associated with that property. He could not see why the particles should vary so greatly in size; the various pock viruses, such as vaccinia, ectromelia, and cow-pox, varied hardly at all. Monomolecular inactivation by heat gave no relevant information. He appealed to workers in the East to state whether phages had a therapeutic action or not against plague, cholera, and similar diseases.

Dr. A. FELIX objected to Dr. Burnet's theory on the ground that, since both the phages and the bacterial antigen were colloids, they were not separable by a simple procedure like washing, and that the antigen, which could be adsorbed to the phage particles, might be responsible for the production of antibodies, which appeared to be specific since they did not react to the original antigen of the organism.

Prof. G. S. WILSON supported Dr. Burnet, saying that it was impossible to devise a crucial experiment to settle such a complicated biological problem. The question could only be settled by accumulated evidence. He asked whether lysogenetic strains had been found amongst organisms that had not been in contact with the intestinal canal or sewage. In bacterial cultures it was almost necessary to assume that every organism was infected with a virus, or else that there were special cells which were more or less susceptible to the virus or phage, and in which it could multiply to a certain extent without bringing about complete lysis of the organism. He asked whether Dr. Burnet believed that the association between the phage and the organism was in the nature of a symbiosis.

Prof. WARRINGTON YORKE reminded critics that, unlike a politician, a scientist had a right to change his mind.

Colonel MACKIE, in reply, said that the results of the two large field experiments in India had been wholly satisfactory from the point of view of those workers who had conducted them. Feeling at Calcutta was sharply divided for and against the efficacy of phage. The results of mass treatment in India had appeared extremely good, but an equal decline in incidence had taken place in neighbouring (control) districts and might have been due to an inter-epidemic period. There was some evidence that where bacteriophage had been given as a curative agent to members of households at epidemic times, there had been a notable reduction in incidence, but in some small local epidemics there had been no such reduction. The advocates of phage held that some races of it were still undiscovered and that therefore the mixture was not complete. A large-scale experiment should, he said, be done on herd and laboratory animals; human epidemics introduced so many variable factors that statistics based on them would long remain untrustworthy.

REVIEWS AND NOTICES OF BOOKS

The Early Diagnosis of the Acute Abdomen

Sixth edition. By ZACHARY COPE, B.A., M.D., M.S. Lond., F.R.C.S. Eng., Surgeon to St. Mary's Hospital, Paddington. London: Humphrey Milford, Oxford University Press. 1932. Pp. 247. 10*s.* 6*d.*

THIS useful book has reached a sixth edition. As a guide to student and practitioner in the early diagnosis of acute abdominal conditions it does all that a book can do to support clinical opinion with authority, and to remind the unwary of certain pitfalls. Mr. Cope maintains the position he has previously adopted in regard to the time of operation for acute appendicitis. He says "the view is accepted by most surgeons of experience that every case of acute appendicitis should be operated on within the first 24 hours from the onset or as soon after as is possible." A reiteration of this dogmatic teaching by a surgeon of Mr. Cope's experience would bring comfort to those who have been stirred by doubts on this difficult problem, had it not been qualified by his remark at a discussion at the Royal Society of Medicine that "to say that immediate operation should always be undertaken is not to give the clinician any credit for judgment." In the chapter on acute abdominal disease with genito-urinary symptoms we could find no mention of the cases of diverticulitis which have genito-urinary symptoms as their most striking feature. The chapter on diseases simulating the acute abdomen covers the ground fully, but, while cardiac failure, pericarditis, and angina pectoris are discussed from the point of view of differential diagnosis, no mention at all is made of coronary thrombosis, which is certainly the cardiac condition most liable to be mistaken for an acute abdominal catastrophe.

This book should certainly be included in the library of every practitioner.

Diseases of the Thyroid Gland

Diagnosis and Treatment. By GEORGE CRILE and Associates. Edited by AMY F. ROWLAND. London: W. B. Saunders Co., Ltd. 1932. Pp. 508. 32*s.* 6*d.*

ANY work emanating from the Cleveland Clinic on the subject of thyroid disease is sure of a welcome, since the originality and enthusiasm of Dr. Crile and his co-workers arouse interest even if they do not always induce agreement. This book consists of a series of articles on the various aspects of thyroid disease by 24 contributors, and as is inevitable when a large team collaborate, there is considerable inequality in the merits of some of the articles. One of the best is the chapter on iodine and the thyroid gland, by George Crile, Jun. This admirable summary of the subject has a good bibliography, and is written in a pleasing style. A chapter on carbohydrate metabolism in hyperthyroidism, by Henry J. John, is a clear review of this much discussed subject, and contains suggestive observations. Dr. George Crile's chapters on such diverse matters as the rôle of the thyroid gland in the energy system, endemic goitre, the adrenal factor in hyperthyroidism, and thyroglossal fistulæ are written in his usual attractive way, and are full of stimulating ideas. One of the least satisfactory chapters is that on

routine technique of thyroidectomy, by Robert S. Dinsmore. To the inexperienced thyroid surgeon it can hardly make the steps of the operation clear, and to an expert it will seem full of dogmatism on controversial points. The book is well illustrated and is admirably produced.

Anatomy of the Brain and Spinal Cord

Second edition. By WILLIAM W. LOONEY, A.B., M.D., Professor of Anatomy, Baylor University College of Medicine, Dallas, Texas. Philadelphia: F. A. Davis Company. 1932. Pp. 370. $4.50.

THIS exposition of the most complicated branch of anatomy is planned for the medical student. The bed-rock of the subject is simply and dogmatically displayed along conventional lines; the blending of a certain amount of physiology with the anatomy is well done and increases the teaching value of the book. The diagrams and other illustrations in the text are adequate, and the print and paper are admirable. An unusual and practical feature is the short appendix, wherein a series of clinical cases are described to show how neurological diagnosis must rest upon accurate localisation of the lesion.

While the subject matter is sound enough, it might be brought more up to date in one or two respects without undue elaboration. For example, modern work on the localisation of the sympathetic centres in the hypothalamus is too important to be omitted from any text-book, however elementary. The book will be used with appreciation by students still in the dissecting-room as well as by their seniors revising for final examinations.

Medicinal and Poisonous Plants of Southern Africa

By JOHN MITCHELL WATT, M.B., Ch.B. Edin., Professor of Pharmacology in the University of the Witwatersrand, Johannesburg; and MARIA GERDINA BREYER-BRANDWIJK, Phil. docta. (Utrecht), Research Worker in Phyto-chemistry in the Department of Pharmacology in the University of Witwatersrand. Edinburgh: E. and S. Livingstone. 1932. Pp. 314. 25*s*.

WHILE in Europe most popular folk-remedies have been proved by pharmacological research to be useless, enough have been shown to be of value to warrant the systematic examination of those employed in other parts of the world. In Southern Africa, as is pointed out in the preface to this book, Bushmen, Hottentot, Bantu, and European have contributed to folk-medicine from the great wealth and variety of the flora of that country. Much of this lore is rapidly disappearing before the advancing tide of civilisation, with its synthetic medicines, and it is a matter of urgency that it should be sifted and placed on record before it finally disappears. This important work has been executed here in a careful manner. The authors have aimed at collecting all available information on the medicinal uses, chemical composition, pharmacological effects, and human and veterinary toxicology of the flora of Southern Africa, and have produced an excellent work of reference on the medicinal and poisonous plants of that country. The book provides extensive bibliographies and beautiful illustrations, some of them in colour, and the four elaborate indices, based on the botanical names of plants, the common names from European languages, the native names, and the names of active principles, make for easy reference. The authors are to be congratulated on their scholarship; they have supplied information difficult to get, which may be of importance in leading to the greater utilisation of the natural products of a sub-continent.

The Treasury of Human Inheritance

Nettleship Memorial Volume, Part V. (concluding section, pp. 425–555, with 18 plates). *On Some Hereditary Structural Anomalies of the Eye and on the Inheritance of Glaucoma.* By JULIA BELL, M.R.C.P., Francis Galton Laboratory for National Eugenics. London: Cambridge University Press. 1932. 36*s*.

IN this concluding section of the Nettleship Memorial Volume, Dr. Bell brings to an end her scholarly survey of the literature and pedigrees relating to hereditary anomalies and diseases of the eye. To those who are familiar with the previous sections it needs no recommendation. The conditions here taken up are such anomalies in the size of the eye as anophthalmos, microphthalmos, megalocornea, buphthalmos; anomalies in the development of the iris-aniridia and coloboma iridis; ectopia lentis and glaucoma. Consideration of hereditary nystagmus had, for lack of space, to be omitted, but Dr. Bell hopes it may be possible to take this up at a later date. For the present study over 300 pedigrees have been collected from unpublished and published sources, and are set out together with a very considerable amount of relative detail. The information which the extensive literature has yielded and the deductions to which it leads are discussed with the care and caution that are always associated with the Galton laboratory. Readers will note with regret that with this volume Prof. Karl Pearson brings his distinguished editorship of the series to a close, in view of his approaching retirement from the Galton chair.

The Life and Work of Lucy Bainbridge

By A. H. MCKINNEY, Ph.D., D.D. London, Edinburgh, and New York: Fleming H. Revell Company. 1932. Pp. 201. $2.00.

THE career dealt with in this small book was thoroughly worthy of record, for Lucy Seaman, afterwards Lucy Bainbridge, devoted her long life of 86 years to welfare work, much of which indirectly or directly was associated with medicine. To the end she was unceasing in her endeavours to mitigate suffering, which she began when during the American Civil War, as a young girl, she was a nurse in the army of the North. With one section of the troops she was well known as "Sister Ohio," and when the great Abraham Lincoln spoke to her she remembered that he made reference to her red hair. She also met General Grant, and later was able in one of her books—and she wrote several—to give a vivid picture of the two men. Through her close contact with Clara Barton, an early organiser of Red Cross work, whose life is sometimes compared in America to that of Florence Nightingale, she became acquainted with the conditions under which nursing was conducted some 50 years ago in the United States, especially in the more newly settled parts, and she has described in vivid terms the horrors of pioneer nursing when the women, practically untrained, could only obtain the most rudimentary equipment and when all the facilities of transport were absent. Marriage altered the immediate objectives of her work, but in no way led her to abate her energies which now were directed

towards religious organisation. She travelled round the world, visiting mission stations in various countries, and was the leader of City Mission work in New York. The author of the book was himself formerly superintendent of the New York City Mission Society, while the well-known New York surgeon, William Seaman Bainbridge, is her son, so that on medical and social sides alike the biography appears with authority.

Preventive Medicine

Fourth edition. By MARK F. BOYD, M.D., M.S., C.P.H. London: W. B. Saunders Co., Ltd. 1932. Pp. 532. 22*s*. 6*d*.

THIS book, primarily intended for American medical students and general practitioners of medicine, deals, in 37 chapters, with communicable diseases, deficiency diseases, occupational diseases, puerperal diseases, heredity in relation to disease, certain special problems of hygiene, vital statistics, and public health administration. The writer, having held a chair of bacteriology and preventive medicine, approaches the problems of public health from the scientific point of view, but sets out the information available in a simple and practical manner. The book is copiously illustrated; most of the illustrations are well reproduced, but some of them are perhaps unnecessary. The chapter on milk will be of special interest to sanitarians of this country at the present time: it will probably be news to some of them that chlorine for the sterilisation of milk utensils is now superseding steam in America. It is astonishing and a little disappointing to find practically no reference to the importance of what has been called latent epidemisation and latent immunisation in relation to the problems of epidemics, and the account of modern ideas in relation to the bacteriology of food poisoning is very sketchy. Ample references are supplied to American literature on public health and sanitation, especially to the publications of the various departments of the United States Government.

Dr. Maude Abbott's book on the History of Medicine in the Province of Quebec, reviewed in THE LANCET of Dec. 17th last, is a reprint, with additions and illustrations, of a collection of monographs hitherto only available in Canada. It can be obtained in this country from H. K. Lewis and Co. for 15*s*.

NEW INVENTIONS

UPPER FIXATION FORCEPS

THESE forceps are for fixing the eye in cataract extraction. One foot is placed on the upper limbus and the other 5 or 6 mm. higher up on the globe. They are then closed. This gathers up the intervening conjunctiva to the limbus, where it forms a

fold or pleat held at its base in the forceps. This affords very good fixation. The corneo-scleral section is now made forthwith, the knife cutting out immediately behind the feet of the forceps—i.e., through the posterior layer of the conjunctival fold. This procedure makes a good conjunctival flap.

The forceps are made by Messrs. Down Bros., Ltd., St. Thomas's-street, London, S.E.

D. PRIESTLEY SMITH, M.B., Ch.B. Birm., M.R.C.S

REPORTS AND ANALYSES

PY-SHAN POINTS TEA

(THOMAS CHRISTY AND CO., 4, OLD SWAN-LANE, E.C.)

WE have analysed a sample of Py-shan Points tea, with the following result:—

Moisture	7·2 per cent.
Ash	5·3 ,, ,,
Total extract	45·6 ,, ,,

The tea, when infused for five minutes with boiling water, yielded

Caffein	3·8 per cent.
Tannin	13·6 ,, ,,

So far as analytical figures are concerned the inference may be drawn that the tea is one of good quality. The tannin content, to which importance is attached by some if it be high, is fairly low, the caffein and other constituents are normal. The tea itself is derived from selected tips of the pickings, and as a consequence the flavour of the infusion is not rough, but is soft and refined. This tea was analysed in THE LANCET laboratory 22 years ago, and it is noteworthy that during that long period its high quality has been maintained.

BOURNEMOUTH ORIGINAL SPA WATER

(THE SOUTH-WESTERN MINERAL WATER CO., LTD., SPRING-ROAD, BOURNEMOUTH)

We have had submitted to us a sample of this spa water for analysis and comment.

The water is derived from a deep artesian well, is colourless and odourless, and the dissolved carbonic acid gas imparts an agreeable and "fresh" sensation to the palate. When poured into the glass the excess of gas is liberated, producing a sparkling effect.

When analysed the following results were obtained:—

	Parts per 100,000.		Parts per 100,000.
Silica (SiO_2)	0·80	Soda (Na_2O) ..	7·95
Alumina (Al_2O_3) ..	2·55	Chlorine (Cl) ..	6·72
Iron (Fe_2O_3) ..	1·20	Sulphuric acid (SO_3)	17·50
Lime (CaO)	4·05	Total solids	42·40
Magnesia (MgO) ..	2·62	Free carbonic acid	22·00

These figures may be expressed in combination as follows:—

Silica	0·80	Calcium sulphate ..	7·30
Aluminium sulphate	7·40	Magnesium ,, ..	7·86
Iron bicarbonate ..	1·80	Sodium ,, ..	4·74
Calcium ,, ..	2·29	Sodium chloride ..	11·10

The reaction of the water is faintly acid owing to the presence of free carbonic acid, on consumption however it would become alkaline. The mineral constituents are of interest, particularly the aluminium sulphate, which may have a slightly astringent effect; the bicarbonate of iron will be of use in cases of anæmia, and the sulphate of magnesium and sodium will tend to render the water aperient in character. The carbonic acid gas present is an undoubted aid to digestion, as this gas causes an earlier and more abundant secretion of gastric juice. The water is exceptionally pure, not heavily saline, and brilliant in appearance.

GLOVES FOR A MEDICAL OFFICER OF HEALTH.—At a meeting of the Prescot council's general purposes committee on Jan. 10th, Dr. S. M. Green, medical officer of health, was able to report that during the last month, among a population of about 12,000, there had been no deaths in the district, while the births had numbered 15. Dr. Green was presented with a pair of gloves.

THE LANCET

LONDON: SATURDAY, JANUARY 28, 1933

MIGRAINE

WE publish in this issue the concluding part of a paper by Dr. MACDONALD CRITCHLEY and Dr. F. R. FERGUSON on migraine, a subject in which many members of the medical profession take more than an impersonal interest. There is surely no other disorder which reduces its victims, albeit temporarily, to an equal degree of discomfort, incapacity, and indignity. The triviality of the sick headache—its very name a synonym for futility—usually prevents the sufferer from receiving much sympathy. If the attack is severe he can only lie, more or less prostrate, in a darkened room, waiting impotently until it shall have run its course.

An excellent review of all aspects of the disorder, together with some four hundred references, has recently been published by H. A. RILEY.[1] It must be confessed that neither Drs. CRITCHLEY and FERGUSON nor Dr. RILEY offer the sufferer much hope either of prevention or of cure. Neither prophylaxis nor treatment is likely to be completely successful until the causation of migraine is better understood. The question of ætiology comprises at least two distinct problems which can be investigated independently—the nature of the local disturbance of function responsible for the headache and cerebral symptoms, and the chain of events leading up to this. Several recent investigations promise to illuminate the nature of headache in general and of migrainous headache in particular. G. W. PICKERING and W. HESS [2] have lately sought to ascertain the mode of production of headache by the intravenous injection of histamine. They made the interesting observation that although histamine causes general vasodilatation associated with a rise of the pressure of the cerebro-spinal fluid, headache does not occur during this phase, but only when the vasodilatation begins to decline; when it is at its height the pain can be temporarily abolished by a further injection of histamine. The cause of the headache induced by histamine is not yet clear, but there is plausibility in the view—one of two alternatives discussed by PICKERING and HESS—that it is due to an over-expansion of the cerebral arteries or arterioles, which for some reason only attains its maximum after the preliminary vasodilatation has subsided. This hypothesis assumes additional interest in view of F. HARE'S observations, quoted by RILEY, on the effects upon the migrainous headache of compressing various arteries of the head and neck. HARE found that in unilateral migraine pressure upon the common carotid of the opposite side increased the pain, and in bilateral migraine pressure upon either common carotid removed the pain on the corresponding side and increased it upon the opposite side. He also found that in some cases it was possible to relieve or even to abolish the pain by compressing one of the superficial arteries of the scalp on the side of the headache. Unilateral headache in migraine is often associated with dilatation and increased pulsation of the superficial temporal artery on the same side. There is therefore considerable evidence that migrainous headache is associated with abnormal dilatation of the arteries of the head and can be temporarily abolished by diminishing the blood-flow through them. We do not know whether the pain arises directly from the distended vessels or whether it is an indirect result of their distension. That an increased pressure of cerebro-spinal fluid is the cause of the pain is improbable for several reasons. There is evidence that the pressure of the fluid may be subnormal in migraine and in other states associated with headache—for example, following lumbar puncture and in some cases of head injury. Conversely, provided the leptomeninges are not inflamed, the pressure of the fluid may be considerably above normal without headache resulting—for example, in some cases of hydrocephalus. The cerebral blood-vessels are supplied with sensory nerves and appear to be sensitive to pain. It seems probable that they play a more important part in the production of headache than is generally suspected, even in conditions such as intracranial tumour where some other cause seems operative.

If the immediate cause of the headache in migraine is a temporary functional disturbance of the cranial blood-supply, how is this produced? The distinction of clinical types of migraine made by CRITCHLEY and FERGUSON is likely to be misleading if it is supposed that these types necessarily appear in different people. The same patient may at different times experience a large variety of attacks, headache, vomiting, ocular disturbances, paræsthesiæ, and mild confusion occurring in all possible combinations and also as isolated symptoms; and the attack may be traceable on different occasions to eyestrain, dietary indiscretion, menstruation, exposure to cold, or emotional stress. It is clear that all causes of migraine must possess in common the power to evoke a certain unknown state of the organism which is the immediate cause of the attack. Is there perhaps a toxin which, on the analogy of Sir THOMAS LEWIS'S H-substance, may be called an M-substance, which is a by-product of metabolic, allergic, and other disturbances, and which produces a temporary disorder of the cranial blood-supply? Such a hypothesis is suggested by our present knowledge and may prove of value at least as a basis for future investigations.

Dr. CRITCHLEY and Dr. FERGUSON say that migraine is encountered in people of all types of intellectual ability, in all classes, and in all professions. Those of us who suffer from it, however, will continue to console ourselves with the classical teaching that it affects predominantly, if not

[1] Bull. Neurol. Inst. of New York, 1932, ii., 429.
[2] Brit. Med. Jour., 1932, ii., 1097.

exclusively, the most intelligent and sensitive members of the community. It is, we feel, a disharmony resulting from that exceptional development of the forebrain which differentiates man from the animals, and is thus the badge of a mental type which represents the highest point yet achieved in human evolution.

MANCHESTER AND MUNICIPAL POWERS

WE gave reasons last week for regretting that Manchester had defeated the proposal to ask Parliament for a local Act compelling the pasteurisation of milk. This was only one of several new powers desired by those responsible for the administration of a city which has been a pioneer in English public health. But even if the recent poll had given the town council a majority for its proposals (as on previous occasions), there would still remain the fight in Parliament. The clause for compulsory pasteurisation of milk has no English precedent, and the Select Committee on Local Legislation (if its critics may be believed) concerns itself more with the novelty than with the merits of such clauses. The Manchester incident may revive interest in suggestions which reformers have offered for the removal of the limitations on the powers of municipalities. Why, it is asked, should the town council of some great English city, comparable in wealth, population, and good administration with some of the independent States of Europe, have to resort to the slow and clumsy machinery of petitioning Parliament for a Local Bill whenever it is desired to extend some local service? Why should the Victorian restrictions of the ultra vires doctrine, seemingly evolved in order to control the activities of statutory railway companies, be allowed to fetter municipal corporations? It is anomalous and anachronistic, wrote a critic not long ago, that Birmingham is unable to carry on a milk-distributing trade, that the L.C.C. has never been allowed to help out its tramway system with omnibus services, and that Manchester must go cap in hand to Parliament for leave to undertake any trifling new activity, at great expense and with the possibility of being refused without reason assigned. One possible reform would be to reserve certain matters for national control and to allow the big cities to undertake any service belonging to public health or local government outside the matters expressly reserved. There is nowadays an object lesson in Ulster, where the Belfast legislature can deal with all non-reserved subjects. Similar devolution must be conceded some day to large-scale units of local administration in England, if only to relieve pressure on the Parliament at Westminster.

The problem unfortunately is usually attacked on the lines of party politics. The Local Authorities (Enabling) Bill, twice introduced in the House of Commons in the past six years, proposed to give the bigger local authorities liberty to conduct any business or undertaking which could come within the scope of a company incorporated under the Companies Act. The pros and cons of municipal trading are not the whole matter. There is at present too little margin for experiment in local government, although improved standards of public health have undoubtedly been attained by experiment in progressive localities.

First of all, however, town councils which aim at pasteurisation or anything else that is new, must convince their constituent ratepayers. Democracy must be persuaded to want what it ought to want. It was perhaps a tactical error to load the Manchester programme with as many as 15 different groups of proposals. Objectors to one group were evidently tempted to reject the whole programme. The results were surprising. One of the heaviest defeats was that of a seemingly innocent proposal as to elective auditors. In fact, discrimination was inconspicuous; but can democracy be expected to answer 15 questions at a time?

QUININE AND ITS SUCCESSORS

AFTER long preliminary inquiries the health organisation of the League of Nations asked those countries who favoured the holding of an International Quinine Conference to be supplied with particulars of the local prevalence and treatment of malaria. The valuable information received from 93 health departments has now been codified and published.[1] Of the world's quinine, over nine-tenths is made in Java and Sumatra, and about one-tenth in the Indian Empire, so that for all other countries the amount imported is a measure of what is used. There is one exception, that of Italy, where about 4000 kg. of quinine were made in 1929, being a seventh of the estimated national need. The quinine imports of all countries during 1931 were 60,000 kg., whereas the estimated amount which would have been made had every malaria case received 20 g. annually would have been 1,387,000 kg. One example will emphasise this point. In India, out of 100 million cases—a moderate estimate—only from 8 to 10 millions are treated, and the amount of quinine distributed does not exceed 2·0 g. annually for each treated case. The remedy which seems obvious is the wide planting of cinchona; but the matter is not so simple as that, for 50 years ago Ceylon exported 453,000,000 kg. of bark in one year, whereas now there are only 20 acres under cultivation there.

The problem is essentially economic, and much light is thrown on it by a discussion which took place last June before the Royal Society of Tropical Medicine and Hygiene.[2] As Mr. T. A. HENRY, D.Sc., then pointed out, what faces the Malaria Commission of the League of Nations is the attempt to discover some method of providing treatment for the very many victims of malaria who are too poor to buy quinine, and whose governments cannot afford to provide it free, or even to subsidise its adequate distribution. Colonel S. P. JAMES, who

[1] Enquiry into the Quinine Requirements of Malarial Countries and the World Prevalence of Malaria. League of Nations, Health Organisation. C.H./Malaria/185. Geneva. December, 1932.

[2] Trans. Roy. Soc. Trop. Med. and Hyg., 1932, xxvi., 105; see THE LANCET, 1932, i., 1362.

had opened the discussion, showed how complex treatment of the individual really is. There has to be considered not only the question of plasmodial species, but of strain within the species. In primary cases of subtertian malaria a Roman strain has needed for control eight times as much quinine as an Indian one; a severe Madagascar strain is powerfully acted on by neosalvarsan, a mild Dutch one but weakly. Important, too, is the stage of life-history, for the synthetic product plasmoquine is effective against gametocytes but ineffective against schizonts; while another newly introduced synthetic product, atebrin, has a selective action against the schizonts of avian malaria—an action which P. H. MANSON-BAHR has confirmed for a few cases in man. Again, the St. Mary's Hospital prophylactic experiment showed plasmoquine to be a good preventive of infection, acting presumably in the early stages of the human cycle of the parasite—though unfortunately the daily dose needful for full protection is too near the toxic dose for it to be taken for more than a few days at a time. Furthermore, the effectiveness of drugs depends on a certain duration of infection; while, owing to the fact that in natural conditions infection is often seasonal, there is an apparent seasonal effect on their efficacy. This point has then to be borne in mind in comparing them; so, too, has variation in the constitution of different races of man. Lastly, as Prof. N. H. SWELLENGREBEL pointed out, a system of prophylaxis and treatment of proved value may break down under the bites of many infected mosquitoes, presumably because many sporozoits are injected about the same time.

Speaking on the production of synthetic drugs, Prof. WERNER SCHULEMANN noted that it had never been the aim at Elberfeld to synthesise quinine, but to produce new drugs with action on new and different lines, and giving results which quinine could not give, since it was there held that only on those lines could laboratory research give progress. So far as concerns quinine, the outcome of the discussion may probably be summed up in Sir DAVID PRAIN'S view that the work on these synthetic drugs was such that it was no longer fair or justifiable to urge the further extension of cinchona-growing—significant coming from one with his great experience of the cultivation. Nevertheless, there is at present no drug other than quinine which can be used in the mass to combat malaria with any feeling of safety, and it is even possible that the search for some synthetic product to take its place may aid the cinchona industry; for the evidence seems convincing that it is not quinine but some substance formed from, or by the stimulation of, quinine in the host's body which is curative. Should that unknown body be discovered in the laboratory, it will clearly depend on relative costs whether it is cheaper to produce it from something else, or from cinchona bark. At all events, the essence of the matter at the present time is the question of costs. That the proposed International Quinine Conference should take place is clearly desirable. It will have many and important points to decide.

THE RETARDED CHILD

THE educational problem of the retarded child is one which, except in a few limited areas, has not seriously been faced in England. The Wood report of 1929, which ostensibly dealt with the narrower problem of the mental defective, demonstrated that, from the educational standpoint, the problem of the mental defective was but part of the wider problem of retardation in general, and recommended that the range of special school or class schemes should be correspondingly extended. In view of this report, it is interesting to read[1] of a system now in operation in Massachusetts which provides for the ascertainment and the education of all children retarded more than three years. Dr. DAYTON'S article is written in commemoration of Dr. WALTER E. FERNALD, the initiator of the system, who organised its machinery and provided it with an elaborate scheme of examination. About 30 years ago Dr. FERNALD opened an out-patient department at his school for defectives at Waverley. Later this clinic became a travelling unit which visited schools and conducted examinations of retarded children. Finally, in 1919, a law was enacted making it obligatory for the school committee of each town to ascertain all children in attendance who were three years or more retarded, and also for special classes to be provided wherever there were ten or more such children. The requisite examinations were to be made by the State department of mental diseases, and sufficient travelling clinics have been established, staffed by hospital experts, to cover the whole State. The personnel of each travelling clinic is identical with that usually provided in this country for a child guidance clinic—viz., a psychiatrist, a psychologist, and a social worker; but much of the work assigned to the last is sometimes done by a school nurse or a teacher.

The examination itself is based upon FERNALD'S well-known "ten-point scale," and, although its general lines are similar to those familiar in this country, it is probably seldom, if ever, that examinations of defectives are carried out here with so much elaboration and detailed inquiry. Family history, personal characteristics and social conduct, physical health, are all fully studied, and a psychological examination is carried out, utilising the Stanford-Binet scale. Incidentally, it is curious to note that there is no mention of the use of any performance tests. In this country, examinations of defectives for educational purposes are made usually by school medical officers who, in addition to their ordinary medical training, are expected by the Board of Education to have attended a short special course; but it is only in the larger town and city areas that medical officers obtain such opportunities of experience as will enable them to become expert in diagnosis, and it is notorious that the standards adopted in different areas of the country vary very widely. Only in a very few areas is there an official psychologist, and he has no

[1] Niel A. Dayton, M.D., Director of Research for the Massachusetts State Department of Mental Diseases: The Walter E. Fernald Plan for the Examination of Retarded School-children. New Eng. Jour. Med., Nov. 24th, 1932.

standing in relation to the diagnosis of mental defect. It is quite certain that if ever there is to be provision for the retarded child in the wider sense on the lines suggested in the Wood report there will have to be some modification of the present procedure, and, in particular, a psychologist will have to find a place in the scheme.

We are approaching a time, if indeed we have not already reached it, when more attention will be given to the retarded, the nervous, the difficult, and the delinquent child. A number of experiments in dealing with the retarded by means of "opportunity" classes are in progress, while the movement for child guidance clinics is spreading rapidly. The best evidence of this widespread interest may be seen in the report of a week-end conference which appeared in last week's issue (p. 175). In the examination of these classes of children a diagnosis of mental deficiency is always one of the possibilities; on the other hand, the certifying officer for defectives finds himself frequently confronted with cases of these other types. It seems inevitable, therefore, that the personnel for the examination of defectives should, in future, approximate to that required for these other purposes, and that indeed the personnel of a child guidance clinic and of an education committee for the examination of the retarded should be identical. It may, however, be questioned whether so elaborate a scheme of examination as that of Massachusetts will be practicable or even in every case necessary.

ANNOTATIONS

TEACHING IN MUNICIPAL HOSPITALS

As the result of negotiations between the London Voluntary Hospitals Committee, appointed under Section 13 of the Local Government Act, 1929, and the London County Council, facilities for undergraduate teaching are to be available in certain of the Council's general hospitals. The plan is that for teaching purposes each of the London medical schools will be linked up with one or more London County Council hospitals. The teaching will be in the hands of the staff of the medical school, and since it is difficult to teach on patients whose treatment is not under the control of the teacher, the appointment of consultants to the municipal hospitals from among the staffs of the medical schools is obviously desirable. On the other hand, a medical officer attached to a municipal hospital would presumably be eligible for appointment as a recognised teacher of the University of London. Precise details of the scheme have not yet been worked out but are in process of settlement between Sir Frederick Menzies and the deans of the medical schools. Somewhat similar arrangements have long been in force in some of the hospitals formerly controlled by the guardians, and the idea is to develop and systematise these facilities. The value to students of the clinical material collected in the municipal hospitals can hardly be overrated, while the introduction of systematic teaching into the routine of municipal hospitals cannot fail to be a stimulation to the staff and indirectly to benefit the patients. The innovation, moreover, has historical importance as the first definite link to be established between municipal and voluntary hospital services. The development of these two services on completely independent lines would have been a calamity for the public as well as for the medical profession.

THE PRESCRIPTION OF THYROID

IN the early days of the use of the thyroid glands of animals in medicine, liquid preparations made by extraction with media containing glycerin or alcohol were used. At a later stage, methods were devised for preparing a dry powder from the glands and for making this into compressed tablets. The strength of the tablets was expressed in terms of the equivalent of fresh gland, this representing the only possible means of standardisation at that time. The British Pharmacopœias of 1898 and 1914 described an unstandardised powder prepared from the thyroid glands of sheep, under the name of Thyroideum Siccum, this preparation being usually regarded as about five times as potent as an equivalent quantity of fresh gland. When the prescriber used a Pharmacopœial name, thyroideum siccum or dry thyroid, the dispenser was in no doubt as to his intention, but when the prescription was for tab. thyroid, thyroid extract, or thyroid gland, the dispenser was often uncertain whether the prescriber had in mind the Pharmacopœial preparation or the fresh gland, and such prescriptions were often referred back for elucidation. The unofficial British Pharmaceutical Codex, 1923, attempted to give some guidance on this point in the form of the following statement:—

"Dry thyroid should be dispensed only when thyroideum siccum or dry thyroid is ordered; when thyroid, thyroid gland, or thyroid extract is ordered, the dispenser should supply the fresh gland or its equivalent (1/5) of dry thyroid made up with milk sugar to the weight ordered."

The effect of this advice was that, when any doubt arose, the patient received the smaller of the two quantities which the prescription might possibly be interpreted to mean. For national health insurance purposes the National Formulary expressed the doses of tab. thyroid gland in terms of fresh gland and recorded the corresponding doses of thyroid sicc.

Since thyroid is always handled by the dispenser in the form of the dry powder, or the powder compressed into tablets, there appears to be no justification, except that of habit, for retaining the system of prescribing thyroid in terms of fresh gland. In fact, the inclusion in the new Pharmacopœia of a chemical method of standardising dry thyroid on the basis of its content of the active principle, thyroxine, introduces complications in manufacture which add force to the objections arising from the possibility of ambiguity in reading prescriptions. The British Pharmacopœia, 1932, describes, under the names "Thyroideum, Thyroid," a dry powder which has been standardised and adjusted to contain 0·1 per cent. of iodine in combination as thyroxine. As alternative names, the synonyms thyroideum siccum, dry thyroid, thyroid extract, and thyroid gland are applied to this preparation. These include all the usual names employed in prescribing thyroid, and it is for the prescriber to note that a prescription written with any of these names must be interpreted by the dispenser to imply that the thyroid of the Pharmacopœia is intended. Prescribers who have been accustomed to think in terms of fresh gland and who continue to write their prescriptions on that basis will run the risk of their patients receiving

about five times the quantity of thyroid intended, unless they make it perfectly clear that the dose stated means fresh gland. But this method of prescribing should now become obsolete; the standardised Pharmacopœial preparation is the obvious basis for prescribing thyroid, and practitioners will be wise to accustom themselves to write their prescriptions on that basis. Manufacturers now express the dosage of their tablets in terms of the Pharmacopœial thyroid, and it is expected that in the new edition of the National Formulary the same basis of dosage will be adopted.

PROGNOSIS IN CORONARY THROMBOSIS

ON the day before his death from coronary thrombosis Dr. Carey Coombs corrected the proofs of a paper on prognosis in this disease, and it appears in the current issue of the *Bristol Medico-Chirurgical Journal* (p. 277). It is an amplification of that read at the centenary meeting of the British Medical Association last summer, and deals with 144 cases observed by Dr. Coombs. Of this number 49, or roughly one-third, died in, or soon after, the attack, and of the survivors another third died within 12 months. Age was found to be of some significance in prognosis, since 67 per cent. of those under 60 survived the attack, whereas the attack was fatal in 58 per cent. of those over 70. Sex had very little influence on prognosis, the outlook being slightly more favourable in males. There was no relationship between a history of previous angina and the immediate or remote result; but in those cases in which the pain was abdominal in the attack the outlook was not quite so good as in those in which the pain was thoracic, as is more usual. The important fact which emerges from this study is that the prime factor in prognosis is the severity of the attack itself. This is difficult to assess except from the consideration of the functional efficiency of the heart as revealed by the pulse pressure. In this series 70 per cent. of those patients whose pulse pressure fell to 25 per cent. of the systolic pressure or less died in, or within a short time of, the attack, and all were dead within a year. Unfortunately the converse, that all patients with a wide pulse pressure recover, does not hold true. One other factor is of value in estimating the degree of cardiac damage, and thus the outlook for the patient, and that is the occurrence of pericardial friction. This was heard in 42 cases, and of these 43 per cent. died in the attack and a further 30 per cent. of the survivors within 12 months, whereas the figures for those patients in whom no rub was heard were 25 per cent. and 41 per cent. respectively.

The question of the outlook in coronary thrombosis is one of the most baffling problems in the whole of prognosis, while this paper recalls the loss sustained by the Bristol Medical School.

PHOTOGRAPHY IN THE INFRA-RED

PHOTOGRAPHY by infra-red radiations is one of the most interesting modern developments of the art. Attempts to manufacture emulsions sensitive to infra-red rays date back to Herschel's experiments in 1840, but the preparation of this material has only become practically possible with the introduction of the cyanine group of dyes. Messrs. Ilford have recently discovered a new dye which would allow the preparation of an emulsion of considerably higher speed and greater cleanliness in processing than its predecessors, and are eagerly working to render it even faster, and also to extend its range beyond the 9000 Å which is its present limit. At a meeting of the Royal Society of Arts on Jan. 18th Mr. Olaf Bloch, head of the research laboratories at Ilford, and president of the Photographic Society, reviewed the progress so far made.

The application of infra-red photography to medicine has hardly been explored, but one or two interesting possibilities are suggested. For instance, pathological changes in the myocardium have been illustrated clearly by post-mortem photography. Attempts have been made to photograph soft tissues by the infra-red rays transmitted through them, but the scatter is great and little detail is available in the prints. A photograph of the hand taken by the rays, to which it is slightly transparent, showed little beyond the outline. The infra-red rays, of course, are even longer than the rays of light, and have no penetrating power to compare with even the longest X rays. Mr. Bloch reported that photographs taken in Denmark of a case of lupus showed distinction between dead skin, tissue with lupus nodules in it, and healthy tissue. Results on the diagnosis of skin complaints and of such diseases as produce markings on the skin have not been very promising, but may still yield information of value. The lecturer showed a photograph which must already have attracted the attention of ethnologists: a man who when photographed by ordinary methods appeared to be a typical negro of deep colouring, showed on the infra-red sensitive photograph a surprising modification both of tint and feature which suggested strongly a Mongolian element in his heredity. The new photographs, when compared with orthodox ones of the same subjects, show a startling difference in the modelling of the features and the complexion, and this property may find an application to police work. Black fabrics suitable for use in the tropics can be chosen by their property of reflecting instead of absorbing infra-red rays; the new prints have shown great variation in this property between fabrics which to the eye seem to be of exactly the same hue.

PROLAN AND CANCER

PROLAN is one of the names given to the gonadotropic hormone, secreted by the anterior lobe of the pituitary, which controls the ovarian cycle and induces ripening of the follicles and luteinisation. Whether prolan is one hormone producing these two different processes or whether it consists of two different hormones, one, A, producing maturation, the other, B, luteinisation, is not yet certain. Nor is it clear whether the substance which can be prepared from the urine of pregnant women, and which has the same physiological effect on the ovarian functions, is identical with the hormone prepared from the pituitary, or only closely allied to it, having possibly undergone a slight chemical alteration.[1] What is certain is that while the urine of normal women contains only small amounts of this hormone, there is a great increase during pregnancy. This, indeed, constitutes the basis of the Aschheim-Zondek test for pregnancy. While the urine of normal women contains about 5 mouse units per litre that of pregnant women contains as much as 3000–5000 units. From this it was a natural step to pass from normal to pathological pregnancies, and to study the excretion of prolan in such conditions as hydatidiform mole and chorion epithelioma. In these conditions B.

[1] This question was referred to by Prof. W. Schoeller in THE LANCET of Jan. 7th, p. 40.

Zondek [2] found a great increase in the prolan content of the urine, equalling and even exceeding that found in pregnancy. What is more remarkable is that similarly large amounts of prolan are excreted in the urine of males suffering from testicular chorion epithelioma. In other testicular tumours an increased, though less marked, excretion of prolan has often been found, and Zondek states that "the presence of the follicle-maturing hormone in the urine of men should arouse suspicion of a malignant testicular tumour." This has been confirmed recently in America by R. S. Ferguson,[3] who in an abstract of Zondek's paper states, on the basis of 100 cases of testicular tumours, that in chorion epithelioma the average excretion is approximately 50,000 mouse units per litre, in embryonal adenocarcinoma 10,000–40,000 units, in embryonal carcinoma with lymphoid stroma 2000–10,000 units, in seminoma 400–2000 units, and in teratoma of mixed structure mainly of adult type 50–500 units.

Zondek was thus led to investigate the prolan excretion in patients with other types of tumours, and has recently summarised his results in English in a paper [4] read at the meeting of the American Gynecological Society. The increase in the prolan excretion was found to be much less striking and less common. It was observed in 80 per cent. of women with genital tumours, but the increase amounted only to from 20 to 30 times the normal physiological amount; or, expressed in mouse units, to 100–150. Moreover it was found not only in malignant but also in benign genital tumours. In women with extragenital tumours it occurred in only 36 per cent. of all cases. It is also pointed out that the urine from all these cases, when it is active at all, produces only maturation of the follicle and not luteinisation. An increased prolan excretion has not so far been found in the urine of men with cancer of the prostate. Whether the test for prolan is sufficiently delicate to indicate such relatively small differences in the prolan content of urine is a subject for further investigation. It is clear at any rate that the increased excretion of prolan depends primarily on the type of tumour and, secondly, on its site, and cannot at present be considered as a general reaction to the presence of malignancy. The reason why tumours of the sex glands particularly influence the prolan excretion may perhaps be found in the fact that while the pituitary regulates the functional activity of the sex glands, the latter are also capable of influencing the pituitary. Thus castration produces, as S. Fichera showed in 1905, very definite changes in the anterior lobe of the pituitary. This has been confirmed repeatedly, and has been demonstrated by J. Tandler and S. Grosz (1907) and others also in castrated men and women. J. C. Mottram and W. Cramer (1923) have found that similar but even more extensive changes in the pituitary, affecting not only the pars anterior but also the pars intermedia and the pars posterior, occur when atrophy—even partial atrophy—of the seminiferous tubules is produced by irradiating the testis. Under these conditions the interstitial cells hypertrophy. Zondek noted that castration produced an increased excretion of prolan not only in women but even in men. It seems possible, therefore, that the increase in the prolan excretion in tumours of the genital organs, other than chorion epithelioma, may be due, partly at any rate, to an impairment of the function of these organs produced by the destructive effect of the growth of the neoplasms, and that pathological conditions of the genital organs, other than tumours but involving an interference with function, may also lead to an increased prolan excretion.

The most sensational development of this line of investigation is the claim made in a recent paper by B. and H. Zondek and W. Hartoch [5] that it is possible to inhibit the growth of a transplantable mouse carcinoma by repeated injections of massive doses of prolan. Unfortunately the data given in this paper are too incomplete to enable the reader to form a critical judgment. There are not even figures illustrating the histological appearances of the prolan-treated tumours. What is particularly difficult to understand is the statement that after transplantation of a tumour from a prolan-treated mouse into normal mice, which received no further treatment with prolan, the tumour continued to grow slowly, and that a second transplantation into normal mice further diminished the rate of growth. Clinical experience on the effect of pregnancy—where there is an intense physiological prolanæmia—on cancer does not support the idea that prolan inhibits the rate of growth of a malignant neoplasm, either in the human subject or in mice. If an inhibition of tumour growth takes place in pregnancy it is as an exception and not as a rule. It will be advisable, therefore, to await further confirmation of the experimental findings of Zondek and his collaborators on the alleged therapeutic effect of prolan in cancer.

[2] Die Hormone des Ovariums und des Hypophysen Vorderlappens, Berlin, 1931; Klin. Woch., 1932, xi., 274.
[3] Amer. Jour. Cancer, 1932, xvi., 1189.
[4] Amer. Jour. Obst. and Gyn., Dec., 1932, p. 836.
[5] Klin. Woch., 1932, xi., 1785.

COMPOUND FRACTURES OF THE LOWER LIMB

THE New South Wales branch of the British Medical Association recently held a special meeting to consider compound fractures of the lower limb. Subsequently the *Medical Journal of Australia* (1932, ii., 497, 515) published two opening papers read by surgeons of the Sydney hospitals, and in the same issue commented generally on the treatment of these fractures.

The discussion was an important one and deserves attention from those who, either as staff surgeons or residents, have charge of fracture cases in hospital. Emphasis was laid especially on the responsibility which rests on the surgeon of giving personal care and supervision to every fracture coming under his charge, and of regarding compound fractures as urgent surgical emergencies. Dr. John Hoets and Dr. George Bell, in the opening papers, both spoke of the very great importance of early and efficient treatment in the prevention of infection. Bell put compound fractures in the same category of urgent emergencies as ruptured peptic ulcers; early and efficient treatment, he said, involved excision of the wound (the so-called débridement) within 12 hours of the injury, and thorough cleansing to its depths. The comparative merits and special indications for primary suture and Carrel-Dakin methods of wound drainage and lavage were freely discussed. The protection of young granulating tissue in compound fractures from the trauma resulting from frequent dressings and too active "open" methods of treatment we have only lately begun to appreciate at its true importance. The ideal now is the conversion of an open into a closed fracture. Where the ideal method is not available, as when the time elapsing between injury and operation is 48 hours or over, or when the mechanical difficulties are too great, there is a choice of either

Carrel-Dakin methods, or of Winnet Orr's closed plaster method. The surgical practice of Sydney embraces both, but the surgeons there seem to prefer the Carrel-Dakin. As Hoets puts it: "good results may be obtained in many ways, and also bad results may be obtained when good methods are used badly."

Suggestions were made for improvement in methods of handling of patients between the arrival of the ambulance and the delivery of the patient to the operating theatre. It was urged that Thomas's splints should be carried by all ambulances, and that the bearers should be trained in their use. Dr. Hoets strongly advocated that the patient should be taken straight from the ambulance to the bed in a resuscitation ward, missing out the casualty department. The question was raised as to how far complete resuscitation methods, as used in the base hospitals during the late war, were available in modern hospitals at a moment's notice, and this is a question into which surgeons would do well to inquire.

MATERNAL DIABETES AND FŒTAL DEVELOPMENT

IT is well recognised that diabetes in the mother will often prevent conception, cause abortion, or result in the birth of a small and feeble infant. An apparently contradictory observation has also been made frequently enough to exclude coincidence—namely, that diabetic women are particularly liable to be the mothers of overweight infants. It appears, therefore, that under different circumstances fœtal development may be influenced either favourably or unfavourably by maternal diabetes. Dr. Hans Bix [1] suggests that while a considerable elevation of the blood-sugar will tend to destroy the fœtus, a moderate rise may stimulate its development to an abnormal extent. He gives figures with reference to the birth-weights of children of 192 women between the ages of 30 and 65 in whom diabetes had been diagnosed from one month to five years previously; childbirth had occurred in many instances some years before the diagnosis was made. Of these women, 37 had borne no children, and 30 (19 per cent.) had borne children who were well above the normal weight. A total of 155 women had had 608 children, of which 63 per cent. were of average weight at birth, 18 per cent. weighed eight pounds, and nearly 8 per cent. weighed nine pounds. Of the remaining 66 children, 49 weighed ten pounds and 17 ten to twelve pounds, giving a percentage of 10·8 of "overweight" children. (These figures he compares with W. Zangemeister's,[2] who in an extensive study of the infants of normal women found 3·4 per cent. weighing between eight and ten pounds, and only 0·26 per cent. over ten pounds.) He emphasises the observation that not only women with proved diabetes are liable to bear overweight children, but also women in whom the diabetic condition is not fully established until later years. From this the suggestion follows that an overweight child may represent the first manifestation of a latent diabetes, and Bix quotes several cases in which a raised blood-sugar during pregnancy was unaccompanied by the appearance of sugar in the urine. In two cases a latent diabetic condition was discovered by reason of the abnormal weight of the infant. For this reason he urges the importance of investigating the sugar tolerance of all women giving birth to abnormally large infants, and even where the initial tolerance tests prove normal recommends that the patients should be kept under observation for a long time to prevent a latent diabetes being overlooked. In many of his own cases diabetic symptoms did not develop until more than ten years after the birth of an overweight child.

[1] Med. Klinik, Jan. 6th, p. 50.
[2] Arch. f. Gynäk., 1917, cvii., 405.

SERUM TREATMENT OF CEREBRO-SPINAL FEVER

WE are again approaching the time of year at which the incidence of cerebro-spinal fever is usually maximal, and the Ministry of Health is anxious to secure accurate data concerning the efficiency and potency of the serums used against the infection. As was pointed out in its "Review of Cerebro-spinal Fever," [1] the most valuable test is clinical, and as it rarely happens that any one hospital has sufficient cases for useful differential study, the Ministry "is now endeavouring by means of individual case inquiry to collect and examine all evidence available regarding the results of serum treatment, both as to the methods of administration and as to the nature of the serum used." The coöperation of medical officers of health, hospital medical officers, and medical practitioners is invited, and report forms may be had from the senior medical officer, Med. I., Ministry of Health, Whitehall, London, S.W. 1.

REPRIEVE FROM BLINDNESS

IN ophthalmic surgery sensational cures are rare, but a case published by Mr. Herbert Fisher in the *British Journal of Ophthalmology* for January merits this description. Mr. Fisher, who has himself retired from active practice, publishes the case as an encouragement to those of his colleagues who may be prepared to follow his bold treatment of an apparently hopeless case. A boy developed sympathetic ophthalmia as the result of an accident at the age of 11. The injured eye was removed about four or five weeks after the accident. Sympathetic disease in the remaining eye ensued, and two years after the accident, in May, 1921, the patient first came under the care of Mr. Fisher at Moorfields Hospital. At that time the boy could only perceive light. There was still deep injection and much gross keratitis punctata, total posterior synechiæ, and an occluded pupil from inflammatory exudation over the lens capsule with diminished tension—a pretty hopeless condition on which few ophthalmic surgeons would give other than a bad prognosis. After a course of arsenical injection and a six months' continuance of hot bathings, atropine, and mercury by the mouth, all of which had little effect, unless it was to bring the blood count more nearly to normal, the patient was left practically without treatment for five years, during which time he was educated at a blind school. At the age of 18, seven years after the original accident, he was readmitted to Moorfields Hospital. The sight was then no better than perception of light with uncertain projection to the nasal side. Under a general anæsthetic Mr. Fisher first attempted an upper iridectomy and then a scoop extraction of the lens, without success. Finally he inserted a capsule forceps, one blade into the anterior chamber, the other into the posterior, and thus grasping the lens between its teeth at last succeeded in dragging it out together with the fibrous material in which it was enclosed. This heroic treatment

[1] Ministry of Health Reports on Pub. Health and Med. Subjects, No. 65. London, 1931.

was followed by no unfavourable reaction though, the iris becoming completely updrawn, the eye remained blind. Five months later, however, again under a general anæsthetic, Mr. Fisher performed an iridotomy with de Wecker's scissors, resulting in a centrally placed artificial pupil with vision improved to finger counting at 18 inches, which a year later had improved to 6/36. This vision, obtained in May, 1927, has since been maintained, so that the former pupil of a blind school is now living the life of an ordinary sighted person. In reporting this case Mr. Fisher emphasises three points: (1) the extreme loyalty of the patient and of his mother in not giving up hope of a cure through so many years; (2) from the outset Mr. Fisher had insisted on a long period of years before any operative procedure was attempted; (3) in the end the eye tolerated the violent interference which alone could accomplish any useful results.

THE ALLEVIATION OF LABOUR PAINS

THE great variation in the methods by which obstetricians are attempting to satisfy the public demand for alleviation of normal labour pains is encouraging in so far as it shows active research, but is in itself a proof of what we are weary of hearing—that no ideal anæsthetic for this purpose has yet been found. The question arises whether we are asking too much. At the discussion reported on page 199, Dr. Belfrage spoke of the hope that a method would be found as perfect as that already attained for surgical operations. From the anæsthetic point of view, however, the birth of a child is essentially a physiological operation which differs from surgical operations mainly in the following respects. It may last four or five times as long as any ordinary operation, and cannot be hurried without risk. Skilled medical attention is not, as a rule, available throughout the period, and the pain for which alleviation is sought is intermittent, not continuous. Voluntary muscular effort is required at certain stages of the process, and the patient's welfare is not the sole consideration, since the birth of a partially asphyxiated child may occur, as occasionally after twilight sleep, when the mother's condition has given no anxiety. The search for an effective analgesic which acts over long periods, can be administered safely by a midwife without elaborate or expensive apparatus, does not lessen the involuntary uterine contractions or completely remove the patient's power to assist expulsion by muscular efforts, may well be unsuccessful. Therefore we cannot agree with Mr. Roques (see p. 177) that we must necessarily await the discovery of this ideal anæsthetic before we sanction the use by midwives, with suitable safeguards, of such preparations as are deemed safe in their hands, even if these are not potent enough to do more than diminish the pain. Chloroform capsules are now under trial, and certainly appear to provide a nearer approach to what is wanted than any other device, though they have not escaped criticism.[1] Gas-and-oxygen is generally held to have the advantage over chloroform that uterine contractions are unaffected by its use, but Mr. W. Gilliatt did not except even this drug from his dictum that all anæsthetics inhibit contractions (see p. 201). It seems obvious, from the attention given to this subject of recent years, that the demand for less painful labour will become more and more insistent, and that the public are more interested in the solution of this problem than in any obstetric development including even the reduction of maternal mortality and morbidity.

[1] See THE LANCET, 1932, ii., 1070.

VITAL STATISTICS FOR 1932

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infant mortality during the year 1932.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales..	15·3	12·0	65
118 county boroughs and great towns including London ..	15·4	11·8	68
126 smaller towns ..	15·4	10·8	57
London (administrative county)	14·3	12·3	66

The smaller towns are those with estimated resident populations of 25,000–50,000 at the 1931 census. The birth- and death-rates for England and Wales relate to the total population and are calculated on the estimated mid-1932 population. The remaining rates are calculated on the estimated mid-1931 resident population, and relate to the total population for births, but to the civil population only for deaths.

The Registrar-General remarks that for the fourth year in succession the birth-rate is the lowest on record, being 1·0 per 1000 below that of 1929 and 1930, and 0·5 below that of 1931. The death-rate is 0·3 per 1000, and the infant mortality-rate 1·0 per 1000, below that for 1931. The only year showing a lower rate is 1930. In 1928 the rate was the same—namely, 65.

Mr. H. J. Simmonds, formerly legal adviser to the Board of Education, has been appointed to act as secretary of the inquiry into the affairs of the University of Durham College of Medicine, Newcastle, which is to be held shortly by Sir Amherst Selby Bigge.

THE third International Pædiatric Conference will be held in London from July 20th–22nd under the presidency of Dr. G. F. Still. The proceedings will include general discussions on the Nature of Allergy and its Rôle in Diseases of Children, and the Prophylaxis of Milk-borne Diseases. Members who wish to make communications should inform their international committees, the secretary of the British committee being Dr. Leonard Findlay, 61, Harley-street, London, W.1.

INDEX TO "THE LANCET," VOL. II., 1932

THE Index and Title-page to Vol. II., 1932, which was completed with the issue of Dec. 31st, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, London, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

STAMPS FOR A CONTRIBUTORY SCHEME. — The Merseyside Hospitals Council, which collects nearly £10,000 a year from 33,000 contributors, has adopted a simplified scheme of collecting the money. The contributors are being supplied with cards similar to national health insurance cards, upon which they will affix stamps varying in value from 1*d.* to 5*d.*, purchasable at the various depôts. The stamps will be placed on the cards and cancelled weekly by a date stamp. By this system labour will be saved and book-keeping simplified.

SPECIAL ARTICLES

SOME EPIDEMIOLOGICAL FEATURES OF WHOOPING-COUGH

A STATISTICAL INVESTIGATION

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PART I.

PERHAPS no serious epidemic disease has suffered such neglect by research workers as whooping-cough, and it is mainly our ignorance of its epidemiology and the consequent scant reference to it in the course of medical training which accounts for the apathy of the average practising physician and the lack of interest of most medical officers of health in regard to it.

In a paper elsewhere [1] I have tried to emphasise the fact that whooping-cough in London must now be regarded as the most expensive epidemic disease of childhood when the cost is measured in terms of loss of life, acuteness of physical suffering, permanent damage to respiratory, cardiac, or nervous mechanism, and loss of school attendance, and not in terms of money spent in efforts to combat it. Analysis of the available London notification records have there been shown to lead to the broad conclusions that three-fifths of all children born in London have whooping-cough at some time, and that the periodicity of epidemics might be determined by the occurrence of a temporary latent immunisation sufficient to render between one and four children immune to each child who suffers a manifest attack, such immunity disappearing for the most part by the end of one year from its acquisition.

In the present paper a few additional observations are made on the sex- and age-incidence of whooping-cough in London, its probable incubation period, its transmission in houses, streets, and schools, and the measures of control which might prove efficacious in reducing its ravages. For the data used I am indebted to the medical officers of health of Battersea, Greenwich, Holborn, and Wandsworth, where the disease is notifiable, who have rendered every possible assistance by placing the original records at my disposal. My thanks to the school medical department of the London County Council are expressed later.

Incidence by Sex and Age

The unusual sex ratio in whooping-cough has been a subject of comment for a long time. Statistics of mortality have been analysed by Laing and Hay [2] for Aberdeen, by Crum [3] for the United States of America registration area, by Godfrey [4] for New York State, by Hay and Russell [5] for London and Glasgow, and by Stevenson [6] for England and Wales, and all agree in showing an excessive mortality-rate in girls as compared with boys. At ages under 5 the ratio of female to male mortality-rates was about 1·07 in Aberdeen (1891–1900), 1·12 in Glasgow (1891–1900), 1·20 in London (1911–14), 1·22 in the United States registration area (1900–19), and 1·31 in England and Wales (1911). It was also shown by Hay and Russell [5] that the ratio increases from the first to the fifth year of life, thus :—

Age	0–	1–	2–	3–	4–
London, 1911–14	1·09	1·25	1·37	1·52	1·82
U.S.A., 1900–19	1·09	1·41	1·45	1·56	1·59

These figures refer to mortality, but the incidence of whooping-cough is also greater amongst females than males. It has been shown by Crum [3] from the Aberdeen data, and by Godfrey [4] from notification data in New York State that the ratio of female to male incidence is apparently higher at ages over 10, or over 15, than for younger children, but it has not been clearly demonstrated at what age the ratio begins to increase. I have therefore analysed in Table I. the data relating to some 15,000 notified and reported cases in Greenwich 1919–29, Battersea 1925–30, Wandsworth 1926–28, and Holborn 1921–28, as regards the age- and sex-distribution.

The ratios between numbers of cases need correction owing to the changes with age in the sex ratio in the living population, and this has been done in the last lines in the Table, which shows the ratios between the rates of incidence based upon the census populations of 1921, weighting the population of each borough by the total numbers of cases reported, since the period covered was not the same in each. It is evident that the sex ratio at ages up to 4 years was about 1·05, or 5 per cent. greater in girls ; it then increased to 1·2, or an excess of 20 per cent., by the eighth year, and to 1·5, or 50 per cent. excess, by the tenth year. In adults the ratio was as high as 3 to 1, but this may be partly due to deliberate concealment of the disease by men. Godfrey's figures for New York State in 1913–26 showed a ratio, between numbers of cases, about unity in the first two years, about 1·05 from 2 to 14, 1·2 at 15 to 19, and 2·3 at ages over 20, but from the London data it would appear that there is a significantly greater susceptibility of female infants from birth, and that the contrast increases from the fourth year onwards.

Seasonal Difference in Sex Ratio in Greenwich

It has not been ascertained, as far as I am aware, whether the sex ratio is more abnormal during certain seasons of the year than others. Analysis of the Greenwich cases during the decade 1919–29 according

TABLE I

—	Age-group— 0–	1–	2–	3–	4–	5–	6–	7–	8–	9–	10–15.	15 and over.	Total.
Total males	813	836	846	997	1118	1334	793	265	103	45	89	24	7263
„ females ..	844	872	867	1039	1259	1537	863	319	125	69	136	90	8020
Ratio of cases F : M	1·038	1·043	1·025	1·042	1·126	1·152	1·088	1·204	1·214	1·533	1·528	3·750	—
„ rates „	1·046	1·087	1·030	1·025	1·143	1·195	1·112	1·217	1·192	1·556	1·518	3·039	—
„ „ „	1·047				1·143	1·161		1·209		1·530		3·039	

to sex, age, and month of the year when whooping-cough began, shown in Table II., indicates that from October to January the ratio of girls to boys, based on 1383 cases, was 1·0073; from February to April, based on 1339 cases, it was 1·2206; and from May to September, based on 1166 cases, it was 1·2337. Stated in another way, the percentages of females were respectively 50·18±0·91, 54·97±0·92, 55·23±0·98, the differences between the first and second, or first and third, being four times their probable errors.

Sex- and Age-incidence in Battersea

In Battersea the excessive liability of girls to whooping-cough was much less pronounced. This is shown in Table IV. The ratio of girls to boys in the census population was also higher, and at all ages under 10 in 1921 the sexes were approximately equal in numbers, the ratio being 1·002. There was therefore at ages up to 7 an excess of only 5 per cent. in the liability of girls to whooping-cough, compared with 15 per cent. in Greenwich, but at all ages over 7 combined there was in each borough an excess of about 40 per cent. Amongst the "primary" cases, here defined as those which were followed by another case in the same house after an interval of 4 to 28 days, the sex ratio at ages under 10 was 1·201, which is apparently but not significantly higher than the ratio for other cases. No significant difference was found in the ratios in different epidemic phases. The distribution of primary cases by age in Battersea shows a relative excess of children at ages 4, 5, and 6 above the expected numbers based upon the distribution of all cases under 10 years of age; the actual number at these ages was 403 out of 715, and the expected number 322. The chance of such a distribution of primary cases arising by random sampling is less than one in a million. It is evident that children at these ages are more liable to infect their brothers and sisters than are younger or older children. Thus 14·8 per cent. of the children at ages 4, 5, and 6 were followed by a secondary case after an interval of 4 to 28 days, whereas 9·4 per cent. of children of other ages under 10 were so followed.

When the distributions according to age during different phases of the epidemic cycle are compared with the expected figures, a slight excess of children at ages 3 to 6 and a corresponding deficiency at ages under 3 is noticeable during the rising epidemic phases. There is also a relative excess of babies attacked in the interepidemic periods.

TABLE II

GREENWICH WHOOPING-COUGH CASES 1919–29 ANALYSED ACCORDING TO SEX, AGE, AND MONTHS OF ONSET

Age-group.	October to January.			February to April.			May to September.			Total ratio F : M.
	Cases.	Per mille.	Ratio F : M.	Cases.	Per mille.	Ratio F : M.	Cases.	Per mille.	Ratio F : M.	
0–	182	132		190	142		154	132		1·008
1–	181	131	0·948	157	117	1·151	136	117	1·160	
2–	130	94		147	110		116	99		1·106
3–	193	140		189	141		153	131		
4–	218	157	1·045	186	139	1·234	174	149	1·210	1·157
5–	240	173		241	180		232	199		
6–	124	90	0·936	130	97	1·363	95	82	1·287	1·176
7–	52	37		54	40		56	48		
8–	23	17		16	12		12	10		1·274
9–	10	7	1·446	8	6	1·250	10	9	1·465	
10 and over	30	22		21	16		28	24		1·821
Total	1383	1000	1·0073	1339	1000	1·2206	1166	1000	1·2337	—

The sex ratio in the census population under 10 being 0·9750, it is evident that in the autumn months and January girls under 10 were about 3 per cent. more susceptible to contract whooping-cough than boys, but during the rest of the year girls under 10 showed an excess of about 25 per cent. in susceptibility in comparison with boys. In January, February, and March the ratios were 1·0404, 1·1900, and 1·1734 respectively, the equivalent percentages of females being 50·99±1·58, 54·34±1·60, 53·99±1·45. The month of April gave the highest ratio, 1·3355; in September it was 1·2462, and in October, which gave the lowest ratio, 0·8889. This seasonal difference in sex ratio is only apparent at ages under 7, as shown in Table II. The per mille distributions of ages show that whooping-cough does not tend to attack younger or older children to any significantly different extent in winter and summer.

Separating the Greenwich cases into three groups, (*a*) "primary" cases followed by one or more subsequent cases in the same house starting between four days and three months after; (*b*) "subsequent" cases as above defined; (*c*) cases not included in (*a*) or (*b*), the percentage of females were as shown in Table III.

TABLE III

—	Oct. to Jan.			Feb. to Sept.		
	M.	F.	Per cent. females.	M.	F.	Per cent. females.
(*a*) ..	90	86	48·86±2·54	115	146	55·94±2·08
(*b*) ..	89	88	49·72±2·53	156	185	54·25±1·82
(*c*) ..	510	520	50·49±1·05	854	1049	55·12±0·77

(*a*) Primary. (*b*) Subsequent. (*c*) Other.

This shows that the increased liability of girls during a part of the year was equally evident whether they contracted whooping-cough outside or inside their homes.

Incidence with Age in Different Parts of London

During the spring and summer terms of 1932 a special inquiry was carried out by the school medical officers of the London County Council to ascertain what proportions of children entering school at ages 3, 4, 5, and 6 had suffered from an attack of whooping-cough. The main purpose of this inquiry was to discover what fraction of the total incidence of whooping-cough at pre-school ages is reported to the health offices in those boroughs where the disease is notifiable, and this aspect of it has been dealt with

TABLE IV

BATTERSEA CASES IN 1925–30 ANALYSED ACCORDING TO SEX, AGE, AND EPIDEMIOLOGICAL FEATURES

Age-group.	Total cases. M.	F.	Sex not stated.	Ratio F : M.	"Primary" cases.	Per mille distribution of all cases under 10.	Epidemic periods. Increasing phases.	Decreasing phases.	Inter-epidemic periods.
0–	316	337	23	1·066	50 (80)	112	232 (246)	200 (225)	224 (206)
1–	343	360	4	1·037	59 (84)	117	243 (257)	239 (235)	225 (215)
2–	369	378	5		70 (89)	124	257 (274)	272 (250)	223 (228)
3–	430	413	5	1·043	103 (100)	140	318 (308)	270 (282)	260 (258)
4–	481	537	6		138 (121)	169	392 (373)	346 (340)	286 (311)
5–	540	604	8	1·064	181 (136)	191	433 (419)	369 (383)	350 (350)
6–	278	266	3		84 (65)	90	201 (199)	198 (182)	148 (166)
7–	97	117	1	1·157	22 (25)	36	83 (78)	68 (71)	64 (65)
8–	47	40	—		7 (10)	14	31 (32)	29 (29)	27 (26)
9–	15	27	—		1 (5)	7	11 (15)	20 (14)	11 (13)
Total under 10	2916	3079	55	—	715	1000	2201	2011	1838
„ 10 and over	40	92	1	2·300	10	22	44	49	40
Total	2956	3171	56	—	725	1022	2245	2060	1878
Ratio F : M	—	—	—	1·073	1·201	—	1·083	1·031	1·109

NOTE.—The figures in parentheses are the numbers expected if the total under 10 was distributed in the same way as were all cases under 10.

in another paper. A subsidiary purpose was to discover whether children living in the more densely populated or overcrowded boroughs in London tend to be attacked at earlier ages than children living in boroughs where housing conditions are better, and this problem is dealt with below. I am greatly indebted to Dr. C. J. Thomas of the London County Council for suggesting and arranging for this inquiry.

The investigation only related to children undergoing medical examination as entrants to elementary schools, where one of the parents was present at the examination. The parent was asked whether the child had ever had whooping-cough, and the children of each age were classified according to whether the reply was affirmative, doubtful, or negative. Out of 7838 children aged 3, 4, 5, 6, or 7 in this category examined between April 26th and July 20th, 1932, the replies were doubtful in regard to 227. The doubtful cases were therefore omitted entirely and the proportion of affirmatives in the total of affirmatives and negatives was taken to represent the proportion of all children attacked by whooping-cough up to the mean age of the group in question.

Combining all the metropolitan boroughs the result was as shown in Table V.

The irregularity in the steps by which the percentages increase is partly accountable for by the

TABLE V

Age last birthday	3.	4.	5.	6.	7.
Affirmative	427	1049	1381	433	40
Negative	781	1389	1686	390	35
Total	1208	2438	3067	823	75
Percentage having had whooping-cough	35·35	43·03	45·03	52·61	53·33

fact that the mean ages of the groups are not necessarily 3½, 4½, &c., but are influenced by the rules as to ages at which children enter school. The group of entrants aged 5 last birthday has doubtless a mean age less than 5½, and the group of entrants aged 4 last birthday has doubtless a mean age greater

TABLE VI

Borough or boroughs.	Persons per— Room. 1931.	Acre. 1931.	Number with known history. Aged last birthday. 3	4	5	6	Number having had whooping-cough. Aged last birthday. 3	4	5	6	Per cent. having had whooping-cough. Aged— 3 last birthday.	5 exactly.	6 last birthday.
Hampstead and Marylebone	0·76	49·9	19	30	36	4	9	15	11	4		40·3	
Westminster	0·76	51·8	10	35	32	21	3	12	12	13		35·9	
Wandsworth	0·79	38·8	98	242	361	85	40	112	175	52	40·8	48·2	59·7
Kensington	0·80	78·9	7	42	58	14	2	26	31	10		50·8	
Lewisham	0·81	31·4	43	127	226	45	22	60	98	23		45·3	
Woolwich	0·88	17·7	36	59	102	12	11	20	47	6		40·0	
Paddington	0·90	106·8	25	57	53	13	13	25	25	7		45·5	
Chelsea and Fulham	0·92	88·7	61	96	165	42	22	37	65	16		39·0	
Greenwich	0·94	26·2	80	66	71	18	26	24	28	8		37·9	
Camberwell	0·96	56·1	58	148	165	41	19	75	65	21		45·0	
Lambeth	0·97	72·5	45	141	280	78	13	60	136	33	36·1	45·6	
Hackney and Stoke Newington	0·98	64·2	90	180	238	76	35	81	107	45		45·0	54·0
Battersea	0·98	73·8	68	151	184	36	26	71	74	20		43·6	
Hammersmith	1·01	59·3	65	149	148	51	22	68	80	36		49·8	
Holborn and City of London	1·04	46·0	9	17	21	15	4	8	6	7		37·9	
Bermondsey and Deptford	1·10	74·5	77	161	125	32	31	71	59	16	34·4	45·6	
Islington	1·12	104·1	31	48	109	52	3	21	66	38		52·1	
St. Pancras	1·13	73·5	30	36	65	20	13	9	33	9		37·9	
Poplar	1·25	66·5	65	134	105	23	21	51	48	14		41·9	
Southwark	1·28	151·7	49	90	77	16	14	32	24	6		33·4	
Stepney	1·33	127·5	147	241	236	72	45	92	97	30	31·7	39·6	41·1
Bethnal Green, Shoreditch, Finsbury	1·40	137·2	95	188	210	57	33	79	94	19		43·4	

than 4½. It may safely be assumed, however, that the proportion having had whooping-cough before the fifth birthday is represented to a close approximation by the mean of the proportions for the 4- and 5-year-olds, and this is the most reliable figure to use in comparing one borough with another. It has been shown in another paper [1] that the percentage of children attacked up to age x exactly continues to

TABLE VII

Areas defined in Table VI. having at 1931 census—	Percentage said to have had whooping-cough.					
	Children whose age last birthday was—				Before fifth birthday (mean of 4- and 5-year olds).	Difference between rates at 3– and 6–.
	3.	4.	5.	6.		
Persons per room—						
Less than 0·9..	40·8	45·8	45·9	59·7	45·8	19·1
From 0·9 to 1·0	36·1	44·5	41·1	54·0	42·8	18·5
,, 1·0 to 1·2	34·4	43·1	52·1		47·6	
More than 1·2..	31·7	38·9	41·9	41·1	40·4	9·4
Persons per acre—						
Less than 50 ..	38·0	44·2	44·7	55·9	44·4	17·9
From 50 to 70 .	34·7	44·4	45·4	53·7	44·9	17·7
,, 70 to 90 .	37·2	43·7	45·4		44·5	
More than 90 ..	31·1	39·9	44·7	47·6	42·3	16·5

increase from about 44 when $x=5$ to about 60 when $x=10$, after which age whooping-cough attacks are not of common occurrence. In Table VI. the actual frequencies at ages 3, 4, 5, and 6, and the rates at age 3 last birthday, at age 5 exactly, and at age 6 last birthday, are shown for 22 boroughs, or groups of similar contiguous boroughs forming the London area. These areas have been arranged in the table in ascending order of the mean number of persons per room in the areas at the census of 1931, and the mean numbers of persons per acre are also shown. The results are also summarised in Table VII.

It is surprising to find that the percentages of children said to have been attacked by whooping-cough in the first five years of life are no greater in the more crowded areas than in the better-housed areas. In the 3-year-old group there is, in fact, a regular gradation in the reverse direction from $40{\cdot}8 \pm 2{\cdot}3$ per cent. in the boroughs with less than 0·9 persons per room to $31{\cdot}7 \pm 1{\cdot}7$ per cent. in the boroughs with more than 1·2 persons per room, and from $38{\cdot}0 \pm 1{\cdot}9$ per cent. in the boroughs with less than 50 persons per acre to $31{\cdot}1 \pm 1{\cdot}7$ per cent. in those with more than 90 persons per acre. Though this is not so evident at age 5, the correlation coefficient between the number of persons per room and the percentage of children attacked by whooping-cough up to age 5 in the 22 areas of London is $r = -0{\cdot}189 \pm 0{\cdot}139$, that is to say, it is also, if anything, slightly negative. With the number of persons per acre the correlation at age 5 is $r = -0{\cdot}085 \pm 0{\cdot}143$, that is to say, of no significance. Amongst the 6-year-olds, in those areas with less than 0·9 persons per room, $59{\cdot}7 \pm 2{\cdot}5$ per cent. had been attacked, and in the areas with more than 1·2 per room only $41{\cdot}1 \pm 2{\cdot}6$ per cent., the intermediate areas giving 54·0 per cent.; with the number of persons per acre the percentages were respectively $55{\cdot}9 \pm 2{\cdot}5$ and $47{\cdot}6 \pm 2{\cdot}3$.

It is to be expected that the histories regarding whooping-cough attacks given by parents would not be so complete in the poorer districts because mild attacks would more easily have escaped diagnosis or notice, and this might account for a small negative correlation with the density factors, but it could scarcely account for so pronounced a gradation as is seen at ages 3 and 6. It must be concluded that increasing density of housing and of overcrowding tends to decrease the incidence of recognised whooping-cough on children at ages up to 6 rather than to increase it. It would be difficult to account for this except by the greater immunisation of children by subclinical infections where the population is denser. This acquired immunity need not be permanent in its effects, but may be renewed during successive epidemics, and evidence collected in another paper [1] suggests that temporary latent immunisation does in fact occur during whooping-cough epidemics, and accounts for many of the epidemic phenomena.

(To be concluded)

MEDICINE AND THE LAW

Complaint of School Medical Arrangements

A PUPIL'S illness gave rise to a High Court action against a girls' school which occupied three days last week. The pupil and her father alleged negligence and breach of contract. The father said that, when fetching the girl home from school, at the end of July, 1931, he noticed that she looked ill. A doctor was summoned and found her temperature to be 103 and her pulse 130. A surgeon decided on an immediate operation. The patient's condition was one of tuberculous peritonitis; the operation was fortunately successful. The jury were told that she had previously complained of sharp pain more than once, and that the school authorities paid insufficient attention to her pain. The defendants said the girl had a good appetite, slept well, had been winning swimming races, and competing in athletic sports, and seemed to be quite well. Such pains as she complained of apparently yielded to treatment; she does not seem to have mentioned them in her letters to her parents. The medical arrangements for each girl's health were covered by an inclusive capitation fee of 7*s.* per term; they therefore cost the school nothing. The school doctor said he had examined her and found nothing abnormal. The mistress in charge of the girls' health described the measures taken to attend to her. The plaintiffs said they did not attribute the actual infection to the school, but they said the school was negligent in not discovering the girl's illness earlier; had that been done the tubercle could have been treated medically and the peritonitis would not have developed. They said she ought not to have been allowed to continue her gymnastic and swimming exercises, and the doctor's attention ought to have been directed to her condition. After the matron and several teachers had given evidence the jury intimated that they did not require any further witnesses for the defence; they were satisfied that there was no evidence of negligence. This ended the case, though counsel for the plaintiff nevertheless insisted on addressing the jury in a heroic attempt to convert them. He failed, and judgment was entered for the school with costs, the judge observing that it would be shocking if the publicity of this ill-advised claim caused an evidently well-conducted school to suffer in any way. Counsel for the plaintiff in his fruitless final effort enlivened the proceedings by remarking to the jury that, during the examination of the witnesses, the judge had not concealed his hostile view of the plaintiff's case. For this flourish of advocacy (not unattractive to a certain type of client) he was

[1] Stocks, P., and Karn, M. N.: Jour. of Hyg., 1932, xxxii., 581.

naturally checked by the judge, whose reputation needs no defence here. It looks as though the father of the girl had himself to thank if the jury was unfavourably disposed towards the claim from the outset. He had written a disingenous letter to the school authorities on the day after his daughter's operation, attempting to trap them into some admission which would prejudice their defence when legal proceedings were initiated.

Noise Nuisance (Infants' School)

Another school was a less successful defendant in the High Court last week, Mr. Justice Eve granting an injunction against it to a neighbour who complained of the din made by some 30 young children in a playground 36 feet by 23. The school prospectus was quoted to show that the teachers interfered as little as possible and allowed the little pupils to develop their independence unchecked. The plaintiff's wife said she woke up every morning hoping for a wet day because the children would then be kept indoors; another witness said she prayed for fine weather because the children made so much noise if kept indoors. Mention was also made of dancing-classes, and of a bonfire on November 5th. The judge thought the dancing was no great matter, and it would really be intolerable, he said, if children could not celebrate Guy Fawkes' Day with appropriate ceremony. The question of noise-nuisance is one of place, time, and volume. The school was situated in Fitzjohn's-avenue, Hampstead. There was no legal restriction preventing the existence of a school there. A properly conducted school does not constitute an actionable nuisance. The plaintiff had to show that the noise was excessive and was not properly controlled, and that it seriously affected his comfort in his home. If it was no worse than the noise reasonably incidental to the carrying on of a school of that kind, the plaintiff must put up with it. The judge considered that the playground space was too small and that there were occasions when the teachers had failed to check noisy children. But, in granting the injunction, the judge said he hoped it would not be harshly used. He suggested that an enlargement of the playground space, separation of the elder from the younger children, and better supervision of any excessively noisy child would probably suffice to keep the school from infringing its duty to its neighbours.

People who desire to take legal proceedings for the nuisance of noise should make methodical notes of the annoyance of which they complain—a diary of events is often useful. It is common knowledge that successful plaintiffs are often members of the legal profession who not only know their rights, but also know how to marshal and present the evidence in support of their claims for protection.

IRELAND

(FROM OUR OWN CORRESPONDENT)

CHANGES IN ADMINISTRATION

Two important changes in administration have recently taken place in regard to health affairs in the Irish Free State. The National Health Insurance Commission has been abolished, and its place is taken by a controller directly responsible to the Minister for Local Government and Public Health. The Commission was appointed in 1912, consisting of a chairman and three members, of whom one was to be a medical practitioner and one a woman. The original members were Mr. (now Sir) Joseph Glynn, chairman, Mr. (now Sir) Walter Kinnear, Dr. W. J. Maguire, and Mrs. Dickie. Sir Walter Kinnear was transferred to London during the war years, and is now controller of National Health Insurance in England. His place on the Irish Commission was not filled. The other three commissioners remained in office until December 31st last, when the Commission itself was abolished. The medical profession will regret the change both on personal and general grounds. Although the profession and the Commission did not always see eye to eye, the relations between them had for many years been friendly. The presence of a medical man in the body of the Commission ensured that the medical point of view should be recognised there, and Dr. Maguire, who in his early years of office had to contend with many difficulties, had gained for himself the respect and friendship of the medical men who had business with him. It is doubtful whether a lay controller can be as independent as the Commission, but Mr. J. A. McCarron, who has been appointed to the office, has a long experience of the work of the Commission, to which he has been secretary for the past three or four years.

Another important change is the retirement from office of Mr. Edward Francis Stephenson, chief medical officer of the Department of Local Government and Public Health for the past ten years. Before his appointment to this office he had experience as a country dispensary doctor and as Local Government Board inspector. He took up duty at the moment when the establishment of the Irish Free State at once shook traditional methods of administration, and made possible schemes of reform in the public health services long overdue. The infant State was fortunate in having as its chief medical adviser a man well trained in administration and at the same time of progressive mind. The history of Mr. Stephenson's decade of responsibility is the history of a decade of steady and well considered reform in the health services. The county area of administration has been substituted for the poor-law union; the appointment of officers of local authorities has been entrusted to a central commission and freed from the unsavoury environment which formerly surrounded it; county medical officers of health have been appointed in the several counties; the local hospitals have been improved out of recognition; and, finally, the conditions of remuneration and service of the medical officers have been revolutionised. Some of these changes had been begun in earlier years, but their completion has taken place during Mr. Stephenson's term of office, and are largely due to his persistence and influence. His personal relations with the profession have always been of the happiest. Approachable, fair, and upright, he has commanded the respect and liking of his subordinates. With a high ideal of what professional conduct should be, he has insisted on a high standard of service, but he has also defended the members of the medical services against unfair criticism and imposition of every sort. Mr. Stephenson is a Fellow and member of Council of the Royal College of Surgeons in Ireland; a few months ago he was elected an honorary Fellow of the Royal College of Physicians of Ireland in recognition of his services to public health. It is understood that his place in the Department of Local Government and Public Health is to be taken by Mr. Robert Percy McDonnell, F.R.C.S.I.

NOTES FROM INDIA

(FROM OUR OWN CORRESPONDENT)

THE ALL-INDIA INSTITUTE OF HYGIENE

An event of some importance in the history of medicine in India was the public opening of the All-India Institute of Hygiene and Public Health in Calcutta during Christmas week. The ceremony was to have been performed by the Viceroy, and many of those who were assembled in the fine reception hall, which is a feature of the new building, were surprised to see Sir John Anderson, the Governor of Bengal, arrive in the place of Lord Willingdon, who was indisposed. A gift from the Rockefeller Foundation, the institute was completed a year ago, and it was hoped that the six sections which the Government of India had promised to maintain would be opened at the beginning of last financial year, but nothing happened. We understood that it was decided to open the institute with four sections instead of six as promised, but even this remained as a paper decision, and the sanction for the appointment of the director and his assistant only arrived at the last moment. We all looked forward to an announcement by the Viceroy, or his deputy, that the institute was at least to commence work with its four sections this year, but no announcement was made. However, we understand that definite permission has now been granted to advertise the appointments, and it is hoped that within a few months the institute will be more than a mere building; the four sections that are to be opened are public health administration, vital statistics, and epidemiology; malariology; rural hygiene; and biochemistry and nutrition. The institute is to work in coöperation with the School of Tropical Medicine where hitherto the D.P.H. training has been carried out, and where some of the class-work will still be done.

PROGRESS OF RESEARCH

The Tenth All-India Research Workers' Conference was held in Calcutta again this year during the first week in December. The cloud of financial stringency still overshadowed the proceedings, but otherwise the conference was a distinct success. One of the noticeable features was the large attendance of provincial directors of public health. The exceptions were Bombay and Assam, which were represented by the director of the Haffkine Institute, and by the inspector-general of civil hospitals and the director of the Shillong Pasteur Institute, respectively. The Army sent two representatives. Altogether there were over 60 delegates. Major-General Sir J. W. D. Megaw, I.M.S., was the chairman. It was General Megaw who originally suggested, a little over ten years ago, that this conference should be held in order to obtain the opinion of research workers in different parts of India as to the best policy to adopt regarding the expenditure of the income of the Indian Research Fund Association which had been curtailed by the suspension of the annual grant. The grant was in time restored, but has again been cut, and, in order to save the trained personnel of the department from being disbanded, the research programme this year will have to be financed almost entirely out of capital. The future of research in India is thus not on a very sure foundation. However, it is the only thing to be done; this capital was accumulated for a specific purpose, the building of a central research institute, a project which has now been practically abandoned, and it will always remain a source of grievance to the finance department and an excuse for withholding the research grant.

Colonel R. McCarrison made an impassioned appeal for the extension of research on the subject of nutrition and the establishment of a nutritional institute. We all heartily agreed with Col. McCarrison, but he almost defeated his own ends, because when the spell of his speech had passed off we began to wonder what had been the substance of his suggestions. However, his resolution on the subject was adopted unanimously by the conference.

The cholera research policy came in for some criticism; there is a feeling that too much attention is paid to the subject of bacteriophage—undoubtedly an important aspect of the cholera problem, but rather a special aspect. Many delegates were disinclined to accept bacteriophage, as a curative and prophylactic agent, at the valuation of its enthusiastic supporters. There is no doubt that India, as a whole, is passing through a phase of very low cholera epidemciity, and the sceptics would like to reserve their judgment as to the prophylactic value of bacteriophage until there is an epidemic year. On the other hand there is little doubt that India is ahead of many other countries in bacteriophage investigations.

The Government of India's quinine policy was again discussed. The government have got themselves so completely tied up in their own red tape that they can do nothing. They have accumulated a stock of over 400,000 pounds of quinine. In these hard times they would much prefer the money this represents, but rules and regulations appear to stop them selling it at a price which anyone can afford to pay for it. So there it stays. General Megaw has a scheme for getting this quinine to the people at a reasonable price, and after years of struggling with the various departments he is now in a position to say that the scheme has made some progress and *may* be brought into operation within the year. We cannot help admiring his persistence and optimism.

The conferment of a K.C.I.E. on Major-General Megaw, which was announced in the New Year's honours list, will be very popular amongst all sections of the medical community in India. First as a clinician, then as a research worker, and finally as an administrator, Sir John has made for himself three separate reputations, each of high order.

BERLIN

(FROM OUR OWN CORRESPONDENT)

HEART DISEASE AMONG ENGINE-DRIVERS

Dr. Munk and Dr. Spiller, of the Martin Luther Hospital in Berlin, find that, according to figures supplied by the Engine-Drivers' Union, 24 drivers have, within one and a half years, suddenly died while on duty. Of those in active employment 130 died from sudden stoppage of the heart and 120 from cardiac diseases. The total represents 36 per cent. of all the causes of death in this occupation. In Germany, as a whole, only 16 per cent. of the male population over 20 years die annually from cardiac diseases, and the great number of deaths from heart diseases among engine-drivers is the more remarkable, as only men of apparently perfect health are appointed by the railways. The number of retired engine-drivers who suffer from cardiac disorders is also very great, and Munk and

Spiller have formed the opinion the oases must be regarded as occupational in origin. At the request of the union they examined 100 members suffering from cardiac troubles. These all complained of heart attacks with dyspnœa, the degree of the pain varying from slight pain to the typical symptoms of angina pectoris. The attacks were produced by strain and nervous excitement, and occurred less frequently during than after work, sometimes at night. In only 13 cases was valvular disease detected, and in 8 cases enlargement. Hypertony was rare. The electrocardiogram did not in the majority of cases give a sufficiently reliable result to decide whether an alteration of the myocardium or only a functional trouble was present. This question is very important for the medical officers of the railways, who have to decide whether a man may continue his service; whether, in order to recover, he should be sent to a sanatorium for a certain time; or whether he should be discharged. All the men examined stated that the great watchfulness and the feeling of responsibility which the work entails are a constant strain on their nervous systems, and that in many cases this strain has been increased by accidents. Some thought that the irregular hours of service, especially the alternation of day and night work, kept them from sleeping well. The great heat in the engine-driver's box is also mentioned as a possible cause. Some complained that they had too little bodily exercise, and thus suffered from adiposity; it is characteristic of this trade that an engine-stoker, who as such must work very hard, grows fat as soon as he is promoted to be an engine-driver, where he has to stand or sit quietly in his box. The results of the investigation show that mental strain is mainly responsible for the cardiac trouble, and that other factors, such as tobacco or spirits, have little or no effect.

OBSERVATIONS ON MEDICAL EDUCATION

Dr. Morawetz, the well-known professor of clinical medicine at Leipzig University, lately discussed some questions concerning medical training. He said that the principal difference between medical education in Germany and abroad is that in Germany theoretical study prevails, whilst in other countries the student comes in contact with the patient from the beginning. The average German student knows more than the average foreign student, while the latter has more practical experience. Generally speaking, the results in Germany are not worse than abroad—a fact also admitted by foreign experts. Prof. Morawetz does not consider it advisable to hold courses in sick nursing, as was suggested, because, owing to the great number of students, such courses would soon become mere lectures. It would be better to allow students to obtain practical experience by working in hospitals during the university vacations. The "numerus clausus"—i.e., a limited entry of students—is deprecated by Prof. Morawetz, as he thinks this might lead to much unfairness. There would be no guarantee that only the best pupils were admitted to the university, and it is known that many good medical men were by no means brilliant at school. Prof. Morawetz strongly opposes the increase of subjects for examination, for he thinks that the most important subjects—which for the medical man are internal medicine, surgery, and obstetrics—have already fallen somewhat into the background. It would indeed be better for some subjects, such as pathological physiology, social hygiene, and insurance medicine, to disappear from the examination. An extension of the curriculum would only lead to an increase of theoretical knowledge. The new regulation that no medical man is to be admitted to club practice without having been an assistant in a hospital is upheld by Prof. Morawetz because it means an increase of medical efficiency, though it means the student must wait rather a long time before he may enter practice.

CORPUS LUTEUM EXTRACT IN HABITUAL ABORTION

Dr. Wolfsohn, writing to the *Medizinische Welt* (1932, vi., 1616), reports that he has had good results in cases of habitual abortion by the administration of a corpus luteum extract called luteogan. This is an oily solution containing one rabbit unit per cubic centimetre, and in cases of bleeding during the early weeks of pregnancy it is given by intramuscular injection daily or every second day. The usual treatment by rest in bed and tinct. opii is of course given as well. Of ten cases treated seven went to term. In one of the unsuccessful cases there was a myoma, and in one a hydatiform mole, while in the third there was a history of prolonged amenorrhœa which suggested some form of endocrine disturbance other than deficiency of corpus luteum. In cases where in previous pregnancies there was bleeding at the time of the expected periods, luteogan treatment was continued at such times during the first few months. In the other cases it was not required after the subsidence of the hæmorrhage. Wolfsohn comes to the conclusion that this remedy should be tried in cases of early habitual abortion for which there is no apparent cause.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lt. G. Rorison to be Surg. Lt.-Comdr.

H. L. Cleave to be Surg. Lt.

The following appts. are notified:—Surg. Comdrs.: A. W. McRorie, to *Ganges;* G. D. Macintosh to *Victory*, for R.N.B.; and W. F. Beattie to *Pembroke*, for R.M. Infirmary, Chatham.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Sub-Lt. G. H. C. R. Critien and Proby. Surg. Lt. W. Gough to be Surg. Lts.

Proby. Surg. Sub-Lieut. K. W. Martin to be Surg. Sub-Lt.

The following appt. has been made: Surg. Lt. W. M. MacGregor to *Victory*, for R.N.B.

ROYAL ARMY MEDICAL CORPS

Lt. W. J. Officer to be Capt.

TERRITORIAL FORCE

Maj. G. Young resigns his commn. and retains his rank, with permission to wear the prescribed uniform.

B. F. Longbotham (late Cadet Lce.-Corpl., Cambridge Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE RESERVE

Flight Lt. E. A. Aslett is transferred from Class D (ii) to Class D (i).

INDIAN MEDICAL SERVICE

Lt. D. J. Young to be Capt. (prov.).

The undermentioned officers relinquish their temp. commns.: Capts. D. C. Datta and M. N. Rajan.

Mr. J. Currie, M.D. Lond., has been appointed Admiralty Surgeon and Agent for Anderton, Plymouth; and Mr. A. P. McEldowney, L.R.C.P. Lond., M.R.C.S., has been appointed Admiralty Surgeon and Agent for the London District, No. 11—namely, Barnes, Mortlake, and Putney.

SOCIETY OF PUBLIC ANALYSTS.—A meeting of this society will be held at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., at 8 P.M., on Wednesday, Feb. 1st. There will be a discussion, in conjunction with the food group of the Society of Chemical Industry, on the Changes taking place during the Storage of Fruits.

THE DOCTOR'S DAY

"Come, tell me how you live," I cried,
"And what it is you do!"

XII.—NEAR THE WEST AFRICAN COAST

THE chink of teacups on the tray put down just outside the mosquito house woke me, and I heard the sound of the steward's naked feet as he passed through the dressing-room to his daily work. It was 6.30 A.M. The sun was beginning to show bright points of light in the eastern sky, the cocks with their consorts were calling for their breakfast. The parrots in their commodious house downstairs were going through their vocabulary, wishing all who were within call "good morning," and almost in the same breath remarking "you old rascal." The baby leopards in their quarters at the back were squawking for the steward to come and fill their bottles with warm milk, and the usual morning noises proceeded from the compound. Dan Seriki, wagging his tail, came to the door of the mosquito house for his morning biscuit; he had earned his name ("son of a chief") on an occasion when he had been able to find a guinea-fowl which had fallen to my gun, after three boys had searched in vain for nearly ten minutes. Dan had, they said, "sense past three black men."

DISPENSARY ONE

By 7 o'clock I was downstairs and going to the garage for the car in which to proceed to the hospital and dispensary, about one and a half miles away. On my arrival at the hospital compound which encloses two main blocks—one the hospital with 16 beds, the other the administrative building consisting of a large waiting hall with open sides, consulting-room, dressing-room, dispensary, and office—I found a motley crowd of from 70 to 80 waiting for me, of all ages and of both sexes. They were admitted to the consulting-room in order, one by one, by my interpreter, who introduced them to me and gave me details of their troubles. Many of them were for daily dressings, and they were soon passed on into the adjoining room where they were attended to by several native dressers. These youths, recommended to me by the king of the town, I had been able to train to do simple dressings; and indeed they could put on fomentations and bandage as well as many who have received much better education.

The new cases were generally taken last to save time. As each patient came into the room the symptoms were related and I was able to follow most of what was said; but the language was a difficult one, and I felt on surer ground when I had an efficient translation. In passing, I may say I once asked my boy at dinner to bring the soup and he went at once to the pantry and fetched a carving-knife; alas I had used the wrong intonation, the words being spelt alike. At first I was perplexed because most of the patients said they were troubled by a "worm," and I began to think of ascaris or oxyuris, and sometimes tænia, but I soon found that to the native mind all pain was caused by a "worm," and the position in the body mattered not at all. The difficulty was increased by the fact that to be in the presence of the *Dokita*, as I was called, was causing a certain amount of alarm, but in time as my interpreter got to know the question which I asked as a routine I was able to get to the bottom of the matter. A large number of the patients came with surgical conditions. The natives abhor a deformity, and before the advent of European surgery were bound to suffer without relief; when they found that lipomas could be removed, or inguinal hernia cured, they began to take courage and come for treatment. As one was operated on the news spread. I removed from the back of a woman a lipoma weighing 20 lb.; on account of this she had been turned out of her home; she walked back 100 miles to show her cure, and in a week I had three similar cases from her village. They walked the whole way, carrying food and sleeping-mat.

But to return to my patients. Here is a mother carrying astride her hip a bonny boy with eyes like sloes, soft and velvety skin. He does not mind the strange surroundings and plays while his mother holds a long conversation with the interpreter. I wait patiently until the whole tale is told, for the African has a wonderful memory and will hear the whole story before he commences to interpret. A great calamity has befallen her. At 8 months old her boy has cut his two upper incisors before the lower ones, and she has come to see what the "white man" can do to help her. If a baby cuts the upper teeth first he will grow up to be a giant, and will turn every one out of the compound; even his own father and mother will not be treated differently from strangers. Surely the white man has some medicine which will prevent these troubles. I tell her that in my country it does not matter which teeth the baby cuts first; it is a red-letter day, friends come to congratulate the parents and nothing happens to the baby. I talk a long time and when I thought she seemed satisfied she broke out with a request that would I remove the offending incisors and then no evil could happen. I refused, and she went away sorrowful.

The next is a man with a foreign body in his conjunctival sac. It went in yesterday, and his friends had done all they could and failed. I inquired what had been tried. One man had been told off to hold up the top lid, a second to depress the lower, a third had stood in front of the patient and, filling his lungs to the utmost, had forcibly expired into the opened eye. When I used the usual methods, and showed him the offending body, his idea of the medicine of the white man was very high. The next had a fish-bone in his throat. He had tried without success the native method of treatment, which consisted in giving the sufferer a smart blow on the top of the head with the hope that the tonsil would recede and leave the bone free on the surface; no care being taken to avoid a possible dislocation of the vertebræ. A pair of forceps and a tongue depressor sent the man to join the group outside for a gossip before returning home. Then came one or two who wished to have teeth extracted, unheard of before the white man came; in most cases there was no trouble, as pyorrhœa had been allowed to get the upper hand.

The examination of recruits for police, of any school-boys who might be ill, and attendance on sick prisoners, which consisted mostly of minor injuries, kept me occupied until 9 o'clock, when I went home to breakfast.

DISPENSARY TWO

At 10 o'clock, taking my interpreter, I went to the town where the king had built a second dispensary to accommodate those unable for any reason to get to the other. This one was about two miles from the first. The native population of the town is nearly 80,000, the province being about 17,000 square miles in extent. My hospital is the only one in the province, my nearest colleague being 60 miles away to the south or 150 miles to the north. At the dispensary I found a number of children waiting in the verandah. They had small cuts or ulcers and were attended to by native dressers. There were a number of women with babies on their backs, and at a distance a crowd of men in the picturesque dress of the Haussas. They were there to see what was going to happen to the children, as they had been told by the *Registrar* to bring their wives and children to the *Dokita* and could not understand why. Every

birth is reported to the man appointed by the king, who keeps a record of them for me. Month by month the six-months-old babies attend at the dispensary, when I examine them for general fitness, splenic index, and at times take smears to examine for malarial parasites. Then I vaccinate them. At first there was some dismay at the white man's medicine, but when it was explained that this would prevent small-pox there was not a murmur. All know the dire results of small-pox; blind and deaf children are seen on every hand. This elementary effort at infant welfare has been going on for several years, and the infant mortality-rate has fallen from 300–400 to nearer 200 per 1000 births.

By this time it is nearly noon, and as the sun is very hot I return to the hospital to do my morning round there. Most of the patients are convalescent. Several of them have had fractures, which are getting more numerous owing to the number of motor lorries running to the villages around. These lorries were licensed to carry 20 persons besides the driver and his apprentice, but more often than not there are nearer 30 crowded in, and a passenger may fall out or get under the wheels. One or two patients were recovering after radical cure of hernia or hydrocele. I was soon free to retire to the office where papers are typed by my dispenser, ready for the weekly mail to headquarters. One train up and one down to the coast complete the weekly service except when the mail-boat arrives, and once a fortnight the boat-train passes carrying our letters and newspapers, and there is a feverish rush for the post office.

VISIT TO AN OUTLYING STATION

As it was Saturday, and the day on which I usually visited the dispensaries in the district and did general inspection, I gave instructions for the labourers to proceed to my house and carry my loads to the station to catch the local train. My steward had already packed bed, bath, with all the pots and pans which he would need for my meals, chair and table, as it would be necessary for me to spend the night at a rest house. These are houses built by the natives themselves of mud, roofed with grass, with no doors or windows but with mud partitions to allow of two apartments. The floor was concrete, and in each village the chief deputed a man to brush it and have wood and water ready for any officials who might be coming to the village. Lunch having been enjoyed, and a rest necessary on account of the great heat, sometimes 100° F. in the shade, I started. The loads were sent on by train, while with the dog and my gun, in case we saw a guinea-fowl or partridge on the way, and my steward and interpreter behind, at about 3 P.M, I set out by car to do the 63 miles to my destination.

The road was quite good, although in places very hilly; we passed several villages and were saluted by the chiefs and headmen, of whom I made inquiries as to the presence of infectious disease and the like. When about half-way the sky was overcast by a swarm of locusts which came in through the windscreen and windows until both the dog and myself were obliged to protect ourselves. However, the swarm was not a large one, but farther on my journey I saw evidences everywhere of the destruction they had caused. In the maize farms not an inch of leaf remained; and where a day before there had been good crops, now there was nothing but a forest of stalks.

About 5.30 P.M. I arrived at my destination, and as the road to the rest house led past the chief's house it was not long before a procession was seen wending its way to salute me. The old chief led the way, and in the native fashion welcomed me to the town. I made inquiries as to his health and that of his family, his farms, the damage done by the locusts; then a small boy was beckoned forward, carrying a calabash which contained some eggs, and in the other hand a fowl. This was the offering from the chief, and my steward, knowing the custom, came to me for a threepenny-bit which was the perquisite of the small boy, the goods themselves being paid for when I settled up next day for the wood and water necessary for cooking and bath. The chief then retired, having told me that several patients wished to consult me, but as it was late they would come in the morning. Soon after a procession of women came with pots of water on their heads and poured it into large pots holding about 20 gallons which were permanent fixtures at the rest house. A man brought enough wood to supply the needs of the fire until the morning, and the steward and interpreter busied themselves in getting up my bed before the darkness set in.

There are outbuildings at each rest house for the kitchen, and sleeping-quarters for the staff, whose night requirements are a grass mat to lie on, and a cloth like a sheet in which to envelop themselves. After a hot bath and dinner I sat outside where I intended to sleep and, lighting my petrol lamp, set myself to enjoy a book; but soon the mosquitoes got so troublesome that I found it better to get inside my net and read there. I had put down a canvas bag for the dog, and I found I was more inclined to sleep than read. And so the day ended.

PANEL AND CONTRACT PRACTICE

"Personal Service"

THE extent to which a panel practitioner is bound to give treatment himself depends on the organisation of his practice. If he is single-handed without a partner he is not only personally responsible for providing adequate medical treatment for his insurance patients, but is also required to give the actual treatment himself. Obviously he could not be allowed to undertake to attend Mr. A when ill and then to send him on to someone else who could charge him for medical service. But regulations governing partnerships definitely provide that the treatment need not be given personally, though the insured persons' rights are protected by certain conditions. For example, continuity of treatment must be ensured whether the practitioner with whom the patient is insured, his partner, or his assistant is attending the case; further, the insured person can demand to be treated by the principal rather than by the assistant, but he has no such right in respect of a partner. Even the demand to be treated by the principal rather than by an assistant will not succeed if the principal is prevented from attending or is unwilling to attend by urgency of other professional duties, temporary absence from home, or other reasonable cause. In the case of partners then, personal service is not required, though when it comes to assistants the insured person has a stronger claim. Here the insurance committee endeavours to exert some pressure, for to employ a *permanent* assistant to do work under the panel requires the consent of the insurance committee. If such an assistant is appointed, and a scrutiny of prescriptions by the insurance committee indicates that the principal is not doing what they think is his fair share of the work they will try to withhold permission to employ an assistant. Refusal of this permission requires the acquiescence of the panel committee.

In the appeal case reported in our columns last week (p. 159), in which an elderly doctor won his appeal against the London insurance committee, the question

of personal service was the main principle involved. It must not be forgotten that in connexion with these cases whoever is actually treating a panel patient, the principal is entirely responsible for all acts and omissions of the medical attendant, so that he does not escape blame if anything goes wrong.

The attitude of insurance committee members is curious when it is remembered that they are concerned with the interests of insured persons. In these days panel patients may be expected to complain if they do not receive the treatment they expect, or think themselves entitled to. Moreover the days when insurance practitioners were scarce have gone by, and most practitioners find competition increasing. Unless therefore an assistant in a practice is doing his work properly the principal is not likely to retain his services. The panel committees' point of view in these cases is probably the avoidance of "farming out" or the exploiting of one doctor by another. In the case in question there was no farming out at all. Almost unanimously the panel committee passed a resolution that he should be allowed an assistant, the grounds for this decision being that it was in the interest of insured persons themselves. Here was a practice admirably run by an assistant who was popular with the patients and well known to them. He refused to be a partner, preferring his position of assistant. If the opinion of the insurance committee had been upheld the fetish of "personal service" would have resulted in inconvenience to insured patients, with whom the assistant was popular, and hardship to the principal, to the widow, and children of the doctor whose practice he had taken over.

The question of permission by an insurance committee to employ an assistant arises only when this is to be a permanent arrangement. So far as we know no definition has been laid down what is a temporary arrangement. Possibly it would be held to apply to a whole-time assistant employed for more than a reasonable time required to tide over some emergency and might still count as a temporary assistant. But an assistant who became necessary to the principal's practice by reason of the numbers of his panel being higher than that allowed by regulations for a single-handed practitioner would certainly not rank as a temporary assistant. It is doubtful if permission is required for the employment of a part-time assistant.

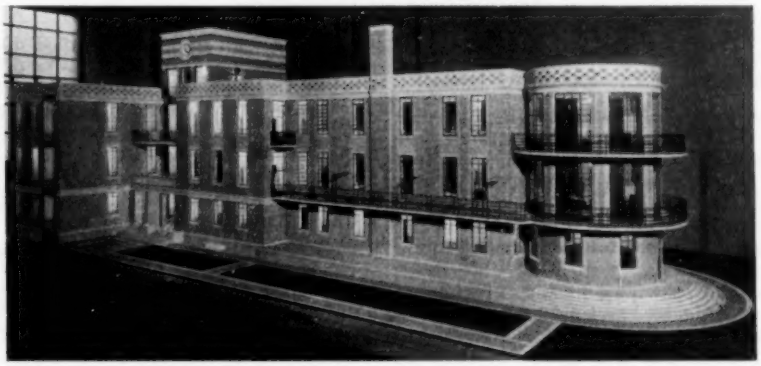
Permanent assistants are usually required to have their names placed on the panel list for the area, but insurance committees are disinclined to encourage such assistants to accept names of patients on their own lists, owing to the amount of clerical work involved when they move on to some other practice or area. If the names are all kept on the principal's list, no such clerical work becomes necessary when a change of assistant is made. Insurance committees cannot of course prevent an assistant from accepting patients for his own list, but they generally suggest to the principal that the acceptances should be for the principal. When subsequently prescriptions are scrutinised to discover the work being done by principal and assistant respectively, the percentages are calculated on the total numbers of the practice. This method of calculation makes it appear that the principal is doing less work than he actually is doing; for in many cases insured persons have joined the panel of this particular practice because they like the assistant and are really therefore his patients though counted for insurance purposes as belonging to the principal. There is probably very little difference from a regulation point of view between a deputy and a temporary assistant, for in either case signatures have to be on behalf of the principal—e.g., A, B, C, for Drs. X, Y, Z.

Deputising

The question of deputising was one of the deciding factors in the other appeal reported last week, also lost by the insurance committee. Here the work required for many of the insured persons in a London hospital was done by a non-panel medical man, but it was denied that he was the deputy of the superintendent of the hospital who was their insurance practitioner on the panel. Here the insurance committee held that a panel doctor was responsible for the certification of insured persons who never consulted him, but who of their own free will received treatment from another doctor, non-panel, and not even under the orders of the superintendent of the hospital where treatment was being given. Now in ordinary general practice many insured persons obtain treatment and certificates from other doctors, panel or non-panel, without the knowledge of their own insurance practitioner. How could he possibly be held to be responsible for such certification? In this case as in the other, the insurance committee, obsessed by "personal service" fetish, were discontented with arrangements under which the insured persons were receiving first-class treatment without cost to the drug fund, and because the certificate given to the insured person did not comply with the National Health certification rules. The obvious remedy for the societies concerned was to refuse to pay sick pay on such certificates. These certificates are always handed to the insured person and are his property. If they are not in order it is the patient's business to have them altered to conform to the rules of his society. The real irregularity was that the certificate from a non-panel doctor did not comply with the certification rules. The clerk of the committee tried to make a subtle distinction between breaking regulations and failing to comply with the regulations, but the legal authorities would not accept this, and the fact that the appeal of the medical superintendent of the hospital was allowed will give general satisfaction.

A PRESENTATION MOTOR AMBULANCE. — The employees' friendly society of the London General Omnibus Co. last week presented to the Manor House Hospital, Golders Green, a 20 h.p. Austin ambulance which cost approximately £800. During the past ten years the omnibus men have contributed over £64,000 to the hospital, and made grants exceeding £5000 in addition. The new ambulance replaces one given in 1926.

HEREFORDSHIRE GENERAL HOSPITAL MEDICAL STAFF.—By the rules of this Hereford hospital there are three honorary physicians and three honorary surgeons. At a recent meeting of the board of management a resolution was passed by 38 votes to 16 that the honorary medical staff should consist of such physicians and surgeons as the board should appoint. When, at the next meeting, the resolution came up for confirmation it was defeated by a majority of 26 to 19. The reasons advanced in favour of the change were that the work had greatly increased owing to the growth in the number of patients, and that in the last few years the nursing staff had gone up from 24 to 56. In opposing the confirmation on behalf of the honorary medical staff, Dr. F. O. T. Strange pointed out that in the last ten years the number of major operations had increased only from 743 to 818 in a year. He argued that it was necessary for the maintenance of his skill and knowledge that an honorary surgeon at a hospital should perform at least 300 or 400 major operations per annum, and produced figures from other hospitals in support of his contention. The board of management had been circularised against the confirmation of the resolution by the entire honorary staff of the hospital.

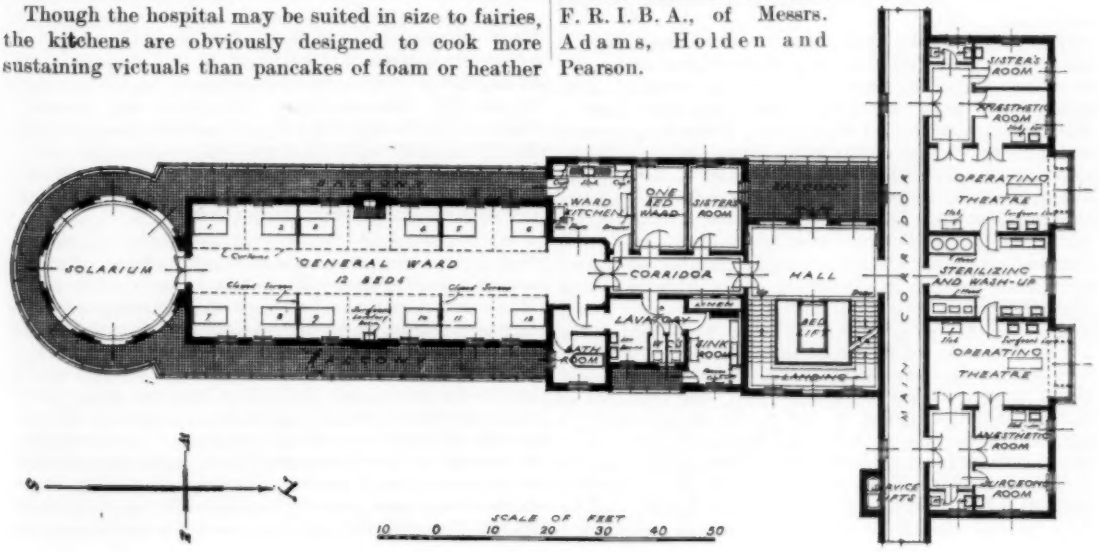


THE MINIATURE HOSPITAL

IN the three weeks of its exhibition at the Building Centre, 158, New Bond-street, the King's Fund model hospital has had more public attention than any other hospital in London. It interests the simple because it is a doll's house, the clever because it is ingenious, and the expert because it embodies the newest ideas of other experts. Those unfamiliar with the inner workings of a hospital can study it with an ease and detachment which is impossible in an establishment where the patients are of full size, the work non-stop, and visitors less welcome. The accompanying plan illustrates the information already given in THE LANCET (Jan. 14th, p. 95). It will be seen that the architects have once more adopted the arrangement by which the beds are placed parallel to the walls, and are partly separated from one another by glazed screens. The advantages claimed for this are that the patient has greater privacy, that he is no longer forced to face the light, and that the radiator which is usually placed under the window is near his feet instead of his head.

Though the hospital may be suited in size to fairies, the kitchens are obviously designed to cook more sustaining victuals than pancakes of foam or heather ale; the visitor hears talk of such technical things as steam-jacketed boiling pans with draw-off cocks. There are roasting and baking ovens, a grill, and in the centre of the kitchen is a gas-heated hot-plate. The kitchen can provide for 300 patients and staff, and everything is designed to ensure cleanliness. The lift has a speed of 90 inches a minute, and the liftman seems to find no difficulty in operating it.

The list of firms who have collaborated in the construction and equipment of the model is impressive Material has been drawn from far and wide; if London provided the bodywork of the motor ambulance, the chassis had to come from Birmingham. No fewer than a dozen kinds of wood have been used in the different parts of the buildings and fittings. The task of building the hospital was made even more difficult by the fact that it had to be strong and compact to stand the long journeys it will make; for people all over the country can look forward to seeing the hospital when it leaves Bond-street. There, however, it remains until Feb. 4th; and there it should be seen. The architect is Mr. Lionel Pearson, F. R. I. B. A., of Messrs. Adams, Holden and Pearson.



CORRESPONDENCE

INFLUENZA

To the Editor of THE LANCET

SIR,—In view of the widespread desire for information of practical value concerning the ætiology of influenza it is perhaps a little rash to broach this matter at all. Nevertheless, I do venture to ask whether your leading article in THE LANCET of Jan. 21st, p. 149, admirable though it be as a summary of recent work on colds, is not too pessimistic on the subject of influenza?

Consider, for instance, the illuminating experiments made in Japan on 52 doctors and nurses who volunteered for this purpose at the time of the pandemic of 1918, and reported in THE LANCET (1919 i., 971) by Yamanouchi, Sakahami, and Iwashima. The sputa of 43 cases of influenza were emulsified in Ringer's fluid. This emulsion was injected into the nose and throat of 12 healthy persons, and the Berkefeld filtrate into 12 more. The results were very striking: among the subjects were 6 who had recently had influenza, and these escaped; the remaining 18 all developed influenza after an incubation period of two to three days. A filtrate of the blood of influenza cases was now injected into the nose and throat of six more healthy persons: the results were precisely the same as in the previous experiments. They next tried the subcutaneous route: four healthy persons received filtered sputum, and four filtered blood; all, with the exception of one who had previously had the disease, developed influenza after an incubation period of two to three days. On the other hand, a pure culture of Pfeiffer's bacillus and a mixture of Pfeiffer with pneumococci, streptococci, taphylococci, and diplococci from the sputum of influenza patients was sprayed into the nose and throat of 14 healthy persons, but no symptoms and no illness followed. Yamanouchi and his colleagues concluded that influenza is due to a filtrable virus which is present in the sputum and blood of influenza patients, and can infect either by implantation on to the mucous membrane, or by inoculation, and that Pfeiffer's bacillus and other bacteria found in the sputum are not the cause of influenza. They point out that all the subjects who had influenza, or who received the sputum emulsion or its filtrate became immune.

These human experiments could be repeated, if necessary, provided that a sufficient sum of money was set aside for the necessary accommodation, equipment, and, possibly, compensation. But it would be desirable first of all to see if the main points could be worked out on the lower apes or other animals, and here the following experience may be of interest. When a sharp outbreak of influenza occurred among the nursing staff at St. Bartholomew's in January, 1922, and material could readily be obtained during the first 24 hours of the attack, a number of nurses who were warded in the acute stage were asked to blow their noses into small pads of cotton-wool. These pads were at once dropped into a flask containing about 200 c.cm. of normal saline, and were shaken. The fluid was then taken to the laboratory, passed through an ordinary Berkefeld filter, and one half of the filtrate was heated to 56° C. for 30 minutes. A pair of guinea-pigs, rabbits, and rhesus monkeys were now injected intracerebrally with the filtrate, one of each pair receiving the raw material, the other the heated. The result was as follows: There was no difference in the effect on the two guinea-pigs or the two rabbits, all of which escaped disease. The day after inoculation, also, there was no difference between the two monkeys. On the next day, however, whereas one monkey was well, the other appeared to be having a typical attack of influenza with other symptoms suggestive of encephalitis. It remained in that state for five days and then recovered. The affected monkey was the one that had received the unheated filtrate: the other escaped illness.

This is, of course, merely a single experiment, but it could easily be repeated if the opportunity occurred of obtaining material at the onset of an outbreak in a hospital with an adequately equipped bacteriological department, where rhesus monkeys happened to be available, as in this particular instance. In view of the steady progress that is being made in our knowledge of the viruses, I would submit that the outlook as regards influenza is one of confident hope rather than anything else. At its worst, the position is far better than the state of affairs as regards small-pox before the work of Edward Jenner.

I am, Sir, yours faithfully,

London, W.C., Jan. 21st, 1933. M. H. GORDON.

EFFICIENT MEDICAL SERVICE

To the Editor of THE LANCET

SIR,—The subject of your leading article of Jan. 7th concerns a large part of the population. It affects not only those included in the National Insurance scheme but many persons with small incomes, and also those who are earning what may be considered a comfortable salary but have no reserve to fall back upon in case of incapacity from illness. An increasing number of such persons are compelled to seek hospital treatment. They desire to have specialised treatment but cannot afford the cost.

Specialised treatment is often necessary to remove localised disease; it is also true that when disease is generalised and severe, if anything can be done at all beyond keeping up the patient's strength, specially skilled treatment is needed. People when they fall sick and do not soon recover often believe that their own doctor has not the skill necessary to diagnose their complaints; or if he has, that he has not adequate means of treatment at his disposal. In cases which require special methods of illumination to see the affected organ the public are probably right. No practitioner who sees only occasional cases has the opportunity of becoming so adept in manipulating the instruments and so skilled in recognising what is visible as the doctor who confines himself to the sort of practice requiring them.

With regard to the second assumption—namely, that he has not as a rule adequate means of treatment at his disposal—the public is again often right. If we leave out the large group of temporary ailments—coughs, colds, indigestion, &c.—which recover quickly with medicine and directions, there are a great number of cases of physical disability which might be temporary but may become permanent. Such are disability of the feet, as a result of temporary ill-health or of a period of malnutrition, weakness of the abdominal walls, and displacement of the abdominal organs following childbirth or an acute illness and imperfect convalescence; and rheumatic changes, neuritis, or neuroses following an

injury or a sprain. Rarely has the practitioner the equipment in his surgery to deal with these. Being short of apparatus he lacks the knowledge derived from experience in its use. For such cases specialised treatment is advised and sought. This may be obtained at the out-patient department of hospitals or at special clinics. How are such cases to be treated without a great expenditure of time on the patient's part? The poor especially have to pay heavily in discomfort, loss of work, and in suffering as well as in time when they are affected. Four solutions can be suggested.

1. Enlarge hospital out-patient departments, increase the staff, and organise the attendances just as you would in a business or in a factory. Attach out-patient departments to what were once the poor-law infirmaries but are now well-equipped hospitals.

2. Extend municipal clinics. Many municipalities provide an excellent school medical service. When the boys and girls now at school grow up will they not ask, Why not continue it for us?

3. Attempt to induce some wealthy approved or insurance society to set up clinics for the treatment of those who insure with them. An appeal might be made to the new rich to assist the new poor in setting up such clinics.

4. The establishment of "medical houses" owned by medical practitioners. A start might be made by a number of medical men who could afford it putting down in common enough money to buy a house, equip it with apparatus for physical treatment, engage sufficient nursing help, and also a clerical staff to arrange appointments and keep records and the books. The spirit of exclusiveness should be absent from a medical house; any medical man who decided to pay a share either in starting the house or in paying rent for his room would be able to see all his patients there and treat them there as well. The attempt should be made in a small way at first till the scheme was tested, its strong points ascertained, and its weak points ascertained and remedied. As the doctors would own the medical house and be responsible for its expenses the incentive to effort to make it a success and a paying proposition would be strong. The incentive to effort on the patient's part, if he is not worn out by long and ineffective treatment carried out in an unbusiness-like manner, would also be strong. He wants to get well. Some patients would prefer to pay for treatment when they needed it; others would prefer to enter into some insurance scheme so as to be assured of treatment if and when they needed it. The medical house should be run on a cash basis. This would be easier than medical practice is at present. There would be an office at which payment would be made for any physical treatment given. The pooling of overhead charges would result in a reduction of expenses to the medical men. This would enable them to concentrate on developing methods of treatment. The result of establishing such a medical house would be that the standard of everyday medical treatment would be greatly raised. Moreover, the public would have their confidence increased.

It would follow that approved specialists in radiology, pathology, and other recognised branches would attend at stated intervals. They would pay their share in the expenses of the medical house and receive payment for their work. The problem of the out-patient department of our hospitals would in course of time be solved, to the great benefit of the hospital, the patients, and the doctors. The backbone of the profession, the general practitioner, would gain in skill, work, and reward.

The fourth alternative is the one which I prefer.

I am, Sir, yours faithfully,

London, W., Jan. 23rd, 1933. A. R. FRIEL.

MANCHESTER AND PASTEURISATION

To the Editor of THE LANCET

SIR,—Are we to remain apathetic while communities generally enlightened, such as Manchester, lose their "reputation for sound sense"? Your annotation (Jan. 21st, p. 152) makes me wonder what, after all, the medical profession as a body has done to lead public opinion on the pasteurisation of milk. If ever there was a case of "doctors differ, patients die," surely we have it here. The fine efforts of the Reading researchers have been made, through misrepresentation, partly responsible for Manchester's continuance to purvey tuberculous milk to the public.

The lead given by both the Ministry of Health and the expert committees working with the People's League of Health has shown us the road; Manchester in attempting to take that road has been worsted by the dragons in the path described as "organised vested interests." If the profession does nothing now it appears to be putting its own vested interests in alignment with those that have been successful in defeating Manchester's Bill. You invite Manchester to "think again"; but surely it is the whole medical profession up and down the country that should be thinking?

I am, Sir, yours faithfully,

ESTHER CARLING.

Berks and Bucks Joint Sanatorium, Peppard Common, Jan. 23rd, 1933.

DERMATITIS FROM DYED FABRICS

To the Editor of THE LANCET

SIR,—Clinical observation and biological investigation have, I think, established that the dermatitis arising from the use of paraphenylenediamine and allied chemicals in hair and fur dyes is allergic in nature.[1] This clears the confusion which previously existed owing to the assumption that chemical irritation was causative.

The question of dermatitis arising from dyed fabrics must be dealt with on its merits as each case arises. The majority of cases will, no doubt, be dependent upon idiosyncrasy, as have all cases so far investigated by Dr. Killick and myself. The object of our paper (Jan. 14th, p. 77) was to draw attention to dermatitis resulting from the wearing of dyed fabrics, which had received little or no attention in the literature.

I am, Sir, yours faithfully,

Leeds, Jan. 21st, 1933. JOHN T. INGRAM.

[1] Roxburgh, A. C.: Brit. Jour. Derm., 1925, xxxvii., 126; Percival, G. H.: THE LANCET, 1931, ii., 417; Ingram, J. T.: Brit. Jour. Derm., 1932, xliv., 422.

INSTITUTE FOR THE SCIENTIFIC TREATMENT OF DELINQUENCY.—A lecture on the Law of Scotland with reference to Young Delinquents will be given by Mr. George Morton, K.C., at 8.30 P.M. on Friday, Feb. 3rd, at University College, Gower-street, London, W.C. Dr. J. A. Hadfield will preside and admission is free. Particulars of further lectures may be had from the hon secretary of the institute, 56, Grosvenor-street, W.1.

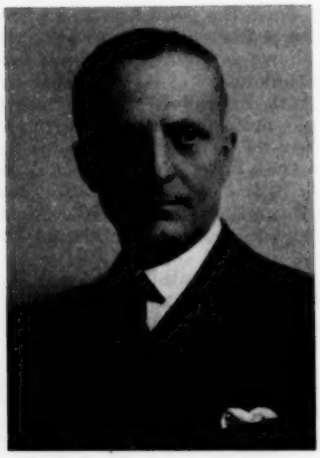
OBITUARY

SIR PERCY SARGENT, C.M.G., D.S.O., M.B. Camb., F.R.C.S. Eng.

SENIOR SURGEON TO ST. THOMAS'S HOSPITAL AND SURGEON TO THE NATIONAL HOSPITAL, QUEEN-SQUARE; VICE-PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS, ENGLAND; HON. COLONEL, A.M.S.

It is with sincere regret that we record the death in London on Sunday, Jan. 22nd, of Sir Percy Sargent, at the premature age of 59.

Percy William George Sargent was born in 1873, the eldest son of Mr. E. G. Sargent of Clifton, and was educated at Clifton College and St. John's College, Cambridge. In 1895 he entered St. Thomas's Hospital medical school, having obtained the University entrance scholarship. In 1898 he took the English double qualification, and in the same year graduated at Cambridge as M.B., B.Chir.; in 1900 he took the F.R.C.S. Eng. At St. Thomas's Hospital he had a brilliant record, and it is of interest that, while he was house surgeon, an astute observer, the late Mr. H. H. Clutton, predicted a great future for him in the surgical world—a prediction which has proved to be correct. He filled the junior posts at the hospital, and was appointed in sequence surgical registrar, resident assistant surgeon and demonstrator of anatomy, being elected in due course assistant surgeon. In 1905 Sargent, in coöperation with Prof. Leonard Dudgeon, gave the Erasmus Wilson lectures at the Royal College of Surgeons of England on the bacteriology of peritonitis, based on the work which they did together when Sargent was resident assistant surgeon, with unique opportunities for the investigation of the subject. The lectures were a forecast of Sargent's position. Those who were associated with Sargent and his work from his early surgical days realised that he had been provided by nature with the equipment—brains, eyes, and hands—essential for a great surgeon. He acquired a perfect technique, which combined with his clinical knowledge of surgery made it certain for him to gain a wide reputation in whatever sphere he elected to practise. It is not surprising that with such gifts he should have directed his attention at a comparatively early period of his career to neurological surgery, and in 1906 he was appointed assistant surgeon to the National Hospital, Queen-square. And not many years elapsed before Sargent was recognised as one of the outstanding personalities in the surgery of the nervous system.



SIR PERCY SARGENT

[*Photograph by Hay Wrighton*

With the outbreak of war, Sargent, in recognition of his special knowledge of cerebral surgery, was appointed consulting surgeon for head and spinal injuries to the B.E.F. in France. Here he worked in conjunction with Dr. Gordon Holmes, his colleague at Queen-square, who had been appointed consulting neurologist to the British Armies in France. Sargent was awarded for his services a D.S.O. in 1917, and received the C.M.G. in 1919. Some of the work performed in these critical times he recorded in the *Journal* of the R.A.M.C., but he was not a prolific writer, three papers, some sound articles on neurological surgery, and the articles on peritonitis and on the diseases of the vermiform appendix in Choyce's System of Surgery being his main contributions to medical literature. In 1928 the order of knighthood was conferred upon him, and in 1929, on the retirement of Sir Cuthbert Wallace from the staff of St. Thomas's, he offered his services to the medical school as part-time director of the surgical unit, being now senior surgeon to the hospital. His offer was welcomed by the governing body of the school, and he retained this appointment until a few weeks before his death. The students who had the opportunity to learn their surgery from him were fully conscious of the advantages which they were deriving. From the academic point of view he may not have been a great teacher, but his teaching was popular with the students because of the practical information he was able to impart, while his kindness to the many who went to him for help was little known to any outside his immediate circle, and was often unsuspected even by his colleagues at St. Thomas's.

Sir Percy Sargent was elected on the council of the College of Surgeons in 1923, and from that time gave much thought to the work of the College. In 1928 he was appointed a Hunterian professor and last year was elected vice-president, and throughout his term of office the affairs of the College of Surgeons were of primary importance to him. Among his other responsible posts, he was joint treasurer with Sir George Makins of the Imperial Cancer Research Fund, and hon. consulting surgeon to the Ministry of Pensions, while he had also acted as president of the neurological section of the Royal Society of Medicine. He examined in surgery at Cambridge, and had the reputation of scrupulous fairness. He gave a considerable amount of his time to work for the benefit of medical men and their dependents in financial distress, was honorary secretary of the Royal Medical Benevolent Fund and keenly interested in its development, and for many years intimately associated with the Invalid Children's Aid Association. He was a very keen Freemason, a Past-Master of several lodges, including the Cheselden and the Cliftonian, to the latter of which he had been secretary since its formation. In 1915 he was appointed Senior Grand Deacon of England. His easy manners and ready wit made him generally popular personally, and he was an excellent after-dinner speaker.

Sir Percy Sargent married in 1907 May Louise, daughter of the late Sir Herbert Ashman; her death in March, 1932, was a very serious blow to him; in fact, it is doubtful if he ever recovered from this loss. He leaves behind him two sons and one daughter, to whom we tender our sympathy.

A neurological colleague writes: "In the death of Sir Percy Sargent English neurology, and especially its surgical side, has sustained a serious loss. He was a direct successor of the founder of modern neurosurgery, Sir Victor Horsley, whose methods he studied conscientiously during the eight or nine years they worked together at the National Hospital, Queen-square, and adapted them to his own special aptitudes.

As Horsley and most other British surgeons who have specialised on the nervous system, he had the great advantage of coming to this branch fully trained and experienced in the principles and the technique of general surgery. Sargent's own special gifts were exceptional manual dexterity, rapidity in work and decision, accuracy and sureness of touch, and an imperturbability which carried him through many a sudden crisis and unforeseen difficulty. As his experience grew he became perhaps too conscious of the risk of radical operations in a field in which failure often meant disaster, but he was never bound by a rigid conservatism, and throughout his career he had few equals in the operative treatment of cerebral and spinal diseases.

"He rightly regarded his earlier years at Queen-square, when he frequently assisted and always worked in close collaboration with Horsley, as a period of training. His opportunity to put the experience he had then gained into practice came with the war, and he seized this opportunity promptly and with characteristic decision. As in the early days of the war the military authorities did not see their way to accept his special services, he went to France with the British Red Cross, and among the wounded of the battles of the Marne and Aisne studied the problems involved in the treatment of acute and often infected injuries of the nervous system, so that when he was later transferred to the R.A.M.C. as a consultant in neurology he was already familiar with the conditions on which he had to advise. His work in this sphere is too well known to need detailing; his tact, his obvious honesty of purpose, and his willingness to help in all circumstances made him a welcome adviser to hundreds of young surgeons. He took full advantage, too, of the opportunities provided by local lesions due to gunshot wounds to study many problems which could be less easily solved by the investigation of ordinary clinical material, and produced some noteworthy contributions to the scientific side of neurology. On returning to England he followed this work up in military hospitals, and later in the neurological hospitals of the Ministry of Pensions at Tooting and Richmond. It was on his work there that the well-known monographs on injuries of the peripheral nerves and of the spinal cord, published by the Medical Research Council, were largely based.

"At the end of the war his colleagues at the National Hospital, now without Horsley, were able to welcome him back and entrust to him much of the operative treatment of their patients. Here he worked continuously till his death, ever ready to give his best efforts to the care of his patients, and constantly anxious to adopt new methods which could improve or render more safe the operations which had gradually, as the years passed, become more complicated and more numerous. His manual skill remained unimpaired and at his death he was still at the height of his career as an operating surgeon. His recent resignation from the staff of St. Thomas's Hospital was welcomed by neurologists, as it was hoped that for many years Queen-square would have his undivided services, and that being able to devote more time to the work which interested him most he would place on record the results of his operations and the lessons to be learned from them. Unfortunately he has written little on neurology, as a busy professional life occupied his time fully, and a rigidly critical attitude towards his own work forbade him to put on record facts and opinions on which any doubt existed. His presidential address in 1921 to the section of neurology of the Royal Society of Medicine on epilepsy, and his papers on vascular tumours of the spinal cord and of the cerebellum are outstanding from his other valuable contributions to the literature. Sargent was universally recognised as a great surgeon and there can be no doubt he has left a lasting mark on neurology, but his chief monument will be the affection and respect he inspired in his professional colleagues and the gratitude of numerous patients who profited by his skill and were comforted by the confidence with which his personality imbued them.

"The outstanding features of his character were loyalty to his colleagues and a constant readiness to coöperate with them, devotion to the welfare of his patients, honesty in professional work and in private relations, and an optimistic enthusiasm which surmounted the disappointments which every neurological surgeon must meet. But to most of those who worked with him Sargent will best be remembered by his personal charm and his capacity for friendship."

MALCOLM EVAN MacGREGOR, M.A. Camb., D.Sc.

WE regret to record the death of Dr. Malcolm MacGregor, director of the Wellcome Entomological Field Laboratories, Claremont, Esher (Wellcome Research Institution), which occurred at his home in Cobham on Jan. 12th, at the age of 43.

Malcolm Evan MacGregor was born at Port Elizabeth, South Africa, in 1889, the son of Robert MacGregor, of Durban, and his wife Clara Grace, daughter of Mr. John Redford, of London He received his scientific education at Trinity College, Cambridge, and Harvard, where he came under the influence of that great medical entomologist L. O. Howard and gained the Carnegie travelling fellowship in the subject, in which he also obtained a Cambridge research studentship in 1914. He first came into prominence during the war, when he served with the R.A.M.C. in East Africa in connexion with mosquitoes and other insect carriers of disease. From East Africa MacGregor was invalided home, and on recovery was placed in charge of a War Office Research Laboratory at Sandwich to study mosquitoes in their relation to the spread of malaria in this country from returned soldiers carrying the disease.

After the war he became the superintendent of the Entomological Field Laboratory, founded by Sir Henry Wellcome on the advice of the late Sir Andrew Balfour, director-in-chief of the Wellcome Bureau of Scientific Research. Here MacGregor continued his studies of mosquitoes, particularly with a view to solving some of the fundamental problems underlying their mode of life, feeding, hibernation, and reproduction. For a period these researches were interrupted by a visit to Mauritius on behalf of the Colonial Office to study the mosquito-malaria problem and to advise on methods of mosquito reduction. A valuable report on the conditions was submitted to the Colonial Office. In it was shown that a second important malaria-carrying mosquito occurred in Mauritius—namely, *Anopheles funesta*—which had been overlooked both by Ronald Ross and Andrew Balfour during their visits to the island. On his return to England MacGregor resumed his mosquito studies which have thrown considerable light on the food requirements and environmental necessities of these insects. He showed that the diverticulum, a sac which opens into the œsophagus of the mosquito, was a kind of reservoir into which the mosquito could direct at will or by reflex action fluids

unsuitable for the stomach. He studied the extraordinary effect of ultra-violet rays on the larvæ, the various reactions of waters in which they occurred, and strove to establish the fact that the larvæ of culex and anopheles mosquitoes lived in waters of different but particular pH. Latterly he had been studying a so-called autochthonous race of *Culex pipiens*, a race which is able to complete its life-cycle without any blood meal, and which does not hibernate. These and other researches were in full swing at the time of his death and there was every promise that during the next few years most important and conclusive results would have been obtained. His death at the height of his scientific career, when many of his researches were about to bear fruit, is nothing short of a tragedy, inflicting a most serious loss upon the science of medical entomology.

Malcolm MacGregor was the author of numerous scientific papers dealing with the subjects of his particular study, and of a book entitled "Mosquito Surveys." He leaves a wife and two sons.

THE LATE SIR ROBERT JONES

Mrs. F. Chaplin Hall, secretary of the Association of Certificated Blind Masseurs, writes as follows: "No obituary notice regarding Sir Robert Jones, the famous orthopædic surgeon, is quite complete without reference to the important part he played in connexion with the blind massage movement in this country. The Association of Certificated Blind Masseurs, a professional body formed in 1919 to represent and safeguard the professional interests of blind masseurs and masseuses, had the honour to have Sir Robert Jones as its president from 1922, a position which he held up to the time of his death. The fact that Sir Robert consented to become the president was not only of inestimable value to the work of the Association, but gave a status and stimulus to the whole movement for massage by the blind. Sir Arthur Pearson, our first president, played the initial part in the formation of a band of educated blind men and women, comprising soldiers blinded in the war and men and women who had lost their sight in civilian life. Many of these took an active part in the treatment of the wounded in the later war period, and were anxious to band themselves together into a recognised body with strong medical backing. The death of Sir Arthur Pearson was a great misfortune for the movement, but Sir Robert Jones served us nobly."

Dr. Macalister writes: "Robert Jones began his career as a general surgeon, and at a very early age was on the staff of the Liverpool Stanley Hospital which he left in 1889 on appointment to the Royal Southern Hospital. It was here that he developed his orthopædic work to which from 1905 onwards he devoted his whole attention. He enlisted the interest of many workers in the out-patient department and also at his free Sunday morning clinics to which poor patients flocked from far and wide. His reputation as an original thinker and teacher brought surgeons from all over the world to his clinics and operations, which were always attended by large numbers of them. In connexion with his out-patient work he adopted the coöperation of the Child Welfare Association whose workers, after some training, kept an eye on the home conditions and feeding of the children. When a student his versatile capabilities were demonstrated at a very early period. He had a knowledge of literature far beyond that of his academic work, and this led to a capacity for debate which became cultivated in a small society, consisting of four students, which met at weekly intervals in the house of his uncle Mr. H. O. Thomas. Matters medical were, it is true, primarily discussed, mainly as a means of revising the week's work, but when these were completed papers were read and debated on literary, political, and social questions concerning which he in particular had very definite opinions. After qualification these four men invited other members of the profession and a number of laymen to join them, and thus in 1884 the progenitor of the Liverpool Medical and Literary Society, now approaching its jubilee, became formally constituted. One of the rules was 'The Society shall exist for the purpose of enabling its members to learn the art of speaking in public,' and there is no doubt that this object was and still is fulfilled. The membership of the society has included most of the leading members of the profession in Liverpool and many eminent in other work. Its 'after-meetings' were limited to a few enthusiasts who adjourned to a room in the basement and expended their pent-up physical energies by boxing, concerning which our friend was both an adept and an authority."

THE LATE MR. RICHARD GILL.—An error was made in our obituary notice last week with regard to the family of Mr. Gill's wife, Elizabeth Ann Bostock, who should have been described as the daughter of Deputy Surgeon-General John Ashton Bostock, C.B., of the Scots Fusilier Guards, honorary surgeon to Queen Victoria.

MEDICAL NEWS

University of Oxford

On Jan. 24th the degree of M.A. (honoris causâ), which was approved by convocation on Nov. 29th, 1932, was conferred on William Stobie, M.D. Edin. On Jan. 19th the degree of Bachelor of Medicine was conferred on H. F. Moseley.

University of Glasgow

The Harry Stewart Hutchison prize, of the value of about £50, for original research in a branch of medical science relating to children, will be awarded next year. The competition is not confined to members of the University of Glasgow. Particulars will be found in our advertisement columns.

Royal Sanitary Institute

At a sessional meeting of this institute, to be held at 90, Buckingham Palace-road, London, S.W., at 5.30 P.M. on Tuesday, Feb. 14th, Dr. J. S. Owens will open a discussion on Ventilation and the Need for New Standards.

The annual congress of the institute will be held at Blackpool from July 17th–24th under the presidency of Lord Cozens-Hardy.

British Congress of Obstetrics and Gynæcology

This congress will be held at Birmingham on April 5th, 6th, and 7th. The principal subject for discussion will be the Uterine Action and its Abnormalities.

Fellowship of Medicine and Post-Graduate Medical Association

Arrangements for next week will be found in our Medical Diary. A course of eight demonstrations on the Interpretation of Pyelograms will be given by Dr. G. Mather Cordiner, beginning on Wednesday, Feb. 8th, at 8 P.M. Forthcoming courses include a course in gynæcology at the Chelsea Hospital, Feb. 6th to 18th; a course in diseases of the chest, at the Brompton Hospital, Feb. 6th to 11th; a week-end course in physical medicine at the London Clinic and Institute of Physical Medicine, Saturday, Feb. 11th, and Sunday the 12th; and an evening course at the National Temperance Hospital, at 8 P.M., on Mondays and Fridays, Feb. 20th to March 17th. Lectures, courses, and demonstrations arranged by the Fellowship are open only to members, and further particulars may be had from the secretary of the Fellowship at 1, Wimpole-street, London, W.1.

World League for Sexual Reform

At a meeting to be held at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C., at 8 P.M. on Wednesday, Feb. 8th, Dr. J. Leunbach, of Copenhagen, will speak on Abortion and Birth Control in Scandinavia.

Hospitals and Road Accidents

The Central Bureau of Hospital Information has, under legal advice, adopted a scheme which it is claimed will, if fully used, enable hospitals to recover up to £150,000 annually in respect of road accident cases. The plan, it is said, has already been adopted by a large London hospital and a small provincial one near a main road. The object is to get round the provision in the Road Traffic Act which limits the claim of a hospital against an insurance company to £25 by substituting a direct claim by the insured person. A reputable firm of local solicitors will be employed by the hospitals which will be responsible for the fees, and in return the patient will include in his claim the cost of his maintenance while in hospital. One of the advantages that it is hoped will result is the elimination of the "hospital chaser," the agent of a shady solicitor who follows up accidents in the hope of inducing injured persons to make claims through his principal. It is claimed that the scheme is applicable in all cases except the following: (1) hospitals whose constitution forbids them to make charges; (2) unwilling patients; (3) patients who for any reason are entitled to free treatment.

Hunterian Society

The annual dinner of this society will be held at the May Fair Hotel, Berkeley-street, London, W., at 7 for 7.30 P.M., on Thursday, Feb. 9th. The guests will include the Lord Mayor and the Lady Mayoress. The senior secretary is Mr. Andrew McAllister, 79, Wimpole-street, London, W.1.

North Staffordshire Royal Infirmary

The expenditure during the last financial year, the annual report states, exceeded the income by £7000, and there is now an accumulated deficit of £16,761. Ordinary income decreased by £1566, while ordinary expenditure rose by £2886. On the other hand, the extraordinary income was greater by nearly £12,000, mainly owing to a legacy of £10,000. There were 5896 in-patients, an increase of 451, and their average daily cost was 10*s.* 3*d.*, an increase of 10*d.* At 132,793 the out-patients' attendances fell by 11,320. In the special fracture clinic of the reorganised orthopædic department 2431 out-patients were registered, a large increase. The hospital is now a regional radium centre and accommodation for 12 male and 12 female radium cases has been provided, and the cases admitted from July 6th to Oct. 31st last year numbered 96. Private wards for 33 paying patients are to be provided immediately, the cost, £15,000, having been raised by an issue of 5 per cent. 20-year notes in multiples of £25 at par. Charges will range from four to eight guineas per week.

PUBLIC HEALTH SERVICES

Influenza

THE number of deaths from influenza reported from the 118 great towns in the week ended Jan. 21st was 1589, as compared with 120, 303, 681, and 1041 in the previous four weeks. For London itself the figure was 338, compared with 8, 25, 93, and 242 in the weeks before. In London, as already pointed out, no indication of unusual prevalence was observed until Dec. 24th–31st. During the week ended Jan. 14th the number of deaths from influenza in the 118 great towns corresponded to an annual death-rate of 2·64 per 1000. The rate for Greater London was less than this—namely, 2·36—whereas the midland area showed a rate of 3·25. The lowest incidence of deaths was in the south-west (0·91) and in Wales and Monmouthshire (0·98). The outbreak was still spreading, for only 8 of the 118 great towns failed to record a single death from influenza, compared with 29 in the previous week.

—	Ages 0–25		25–45		45–65		65+		Total deaths
	Deaths.	Per cent.	Deaths.	Per cent.	Deaths.	Per cent.	Deaths.	Per cent.	
1932 Dec. 17th	15	17·6	9	10·6	21	24·7	40	47·1	85
„ 24th	23	19·2	19	15·8	34	28·3	44	36·7	120
„ 31st	43	14·2	70	23·1	89	29·4	101	33·3	303
1933 Jan. 7th	75	11·0	143	21·0	214	31·4	249	36·6	681
„ 14th	112	10·8	196	18·8	336	32·3	397	38·1	1041

In Scotland, the infection has definitely abated in Glasgow, where in the week ended Jan. 21st there were 27 deaths, the figures for the three previous weeks being 86, 38, and 31. In Edinburgh the deaths during the corresponding four weeks numbered 5, 14, 25, and 19. Belfast reported 6 fatal cases in the week ended Jan. 14th, and on Jan. 17th the new notifications of influenza were stated to be 220.

In many parts of the country—though not in London—schools are closed, and although the infection is generally described as mild, it has been suggested that it especially attacks children and young people while it spares the old. It has been definitely stated, indeed, in one newspaper that the mortality is highest among the young, but no evidence of this appears in the accompanying Table, which shows the age-distribution of deaths from influenza up to the week ended Jan. 14th. It will be seen that so far the greatest proportion of deaths has been in the age-group 65 and over.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 14TH, 1933

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 18 (last week 16); scarlet fever, 1739; diphtheria, 780; enteric fever, 21; acute pneumonia (primary or influenzal), 3456 (last two weeks 2017 and 2816); puerperal fever, 28; puerperal pyrexia, 143; cerebro-spinal fever, 47 (last week 38); acute poliomyelitis, 8; acute polio-encephalitis, 2; encephalitis lethargica, 7; dysentery, 6; ophthalmia neonatorum, 82. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 17th–18th was as follows:—Small-pox 48 under treatment, 3 under observation (last week 52 and 7 respectively); scarlet fever, 1760; diphtheria, 1657; enteric fever, 10; measles, 274; whooping-cough, 524; puerperal fever, 25 (plus 7 babies); encephalitis lethargica, 229; poliomyelitis, 2; "other diseases," 317. At St. Margaret's Hospital there were 15 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there were no deaths from small-pox, 1 (1) from enteric fever, 27 (1) from measles, 8 (1) from scarlet fever, 40 (11) from whooping-cough, 30 (6) from diphtheria, 29 (9) from diarrhœa and enteritis under two years, and 1041 (242) from influenza. The figures in parentheses are those for London itself.

Outside London the largest number of deaths from influenza was again at Birmingham, where 91 were reported (last week 163). Other towns reporting numerous deaths from this cause were Manchester 49 (last week 22), Liverpool 41 (last week 23), Newcastle-on-Tyne 36 (last week 45), Portsmouth 35 (last week 19), Leeds 33(last week 14), Bristol 24, Gateshead 19, Coventry 16, Bolton and Stoke-on-Trent 15 each, Sheffield and Birkenhead 14 each, Barnsley and Sunderland 13 each. Measles caused 9 deaths in Birmingham and 3 in Liverpool. Five of the fatal cases of diphtheria were in Liverpool, and 5 of those from diarrhœa and enteritis were in Manchester.

The number of stillbirths notified during the week was 287 (corresponding to a rate of 45 per 1000 total births), including 41 in London.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
WEDNESDAY, Feb. 1st.—5 P.M., HISTORY OF MEDICINE. Sir John Weir: Samuel Hahnemann and His Influence on Medical Thought. Casual Communication: Dr. E. W. Goodall: Note on the Liber de Febre Pestilentiali of Nicolas Massa.
THURSDAY.—8 P.M., TROPICAL DISEASES AND PARASITOLOGY. Prof. Millais Culpin: An Examination of Tropical Neurasthenia. Members of the Section of Psychiatry are invited to attend.
FRIDAY.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.) Discussion: Early or Late Operation in Acute Mastoiditis. Openers: Mr. Douglas Guthrie and Mr. Scott Ridout. Cases and specimens will be shown. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Discussion: Malignant Disease of the Oropharynx, including the Fauces. Openers: Mr. G. Gordon Taylor, Mr. Norman Patterson, Prof. van den Wildenberg (Antwerp), and Prof. Naisin (Louvain). Cases illustrative of the discussion. 8.30 P.M., ANÆSTHETICS. Paper: Dr. H. K. Ashworth: Nervous Sequelæ of Spinal Analgesia.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, Feb. 3rd.—8.30 P.M. (at Hotel Rembrandt, Brompton-road), Discussion on Artificial Pneumothorax, to be opened by Dr. Saxby Willis, preceded by dinner.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Jan. 30th.—5 P.M., Mr. K. M. Walker: Perurethral Operations on the Prostate. (Hunterian lecture.)
WEDNESDAY, Feb. 1st.—5 P.M., Mr. P. H. Mitchiner: Treatment of Burns and Scalds. (Hunterian lecture.)
FRIDAY.—5 P.M., Mr. J. Paterson Ross: Sympathectomy as an Experiment in Human Physiology. (Hunterian lecture.)

UNIVERSITY COLLEGE, Gower-street, W.C.
MONDAY, Jan. 30th.—5.30 P.M., Sir Charles Sherrington: Flexibility of Reflex Action.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Jan. 30th, to SATURDAY, Feb. 4th.—ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C. Course in Dermatology. Afternoon instruction in the Out-patient Department daily, and lectures at 5 P.M. on Tues. and Thurs.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. A course of four demonstrations on Antenatal Diagnosis and Treatment, by Dame Louise McIlroy, at 5 P.M. on Friday, Feb. 3rd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Tues., 4 P.M., Lecture on Some Important Injuries in the Upper Extremity (with lantern slides), by Major Meurice Sinclair. (Free to Members and Associates of the Fellowship.)

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Jan. 30th.—10 A.M., Skin Department, Surgical Wards. 2 P.M., Gynæcological, Eye, and Genito-urinary Out-patients. 4.15 P.M., Lecture: Dr. Grainger Stewart: Compression Paraplegia.
TUESDAY.—10 A.M., Medical Wards, Surgical Demonstration. 2 P.M., Throat, Nose, and Ear Out-patients. 4.15 P.M., Lecture: Dr. H. Pritchard: Chronic Infections.
WEDNESDAY, Feb. 1st.—10 A.M., Medical Wards, Children's Medical Out-patients. 2 P.M., Eye Department. 4.45 P.M., Venereal Diseases Demonstration.
THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Fracture Demonstration. 2 P.M., Eye and Genito-urinary Out-patients. 4.15 P.M., Lecture: Dr. Shaw: Hæmatemesis.
FRIDAY.—10 A.M., Skin Department. 12 noon, Lecture: Therapeutics. 2 P.M., Throat, Nose, and Ear Out-patients. 4.15 P.M., Lecture: Dr. Konstam: Auricular Fibrillation.
DAILY, at 2 P.M., Medical and Surgical Out-patients, Operations. The Lectures at 4.15 P.M. are open to all medical practitioners without fee.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Jan. 31st.—5 P.M., Dr. A. M. H. Gray: The Sarcoids.
THURSDAY, Feb. 2nd.—5 P.M., Dr. J. A. Drake: Urticaria.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Jan. 31st.—3.15 P.M., Mr. K. M. Walker: Disturbances of Micturition and their Treatment.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, Feb. 2nd.—4 P.M., Dr. Cuthbert Dukes: Ulcerative Lesions of the Intestinal Tract.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Feb. 3rd.—4 P.M., Mr. H. Kisch: Bronchoscopy in Diseases of the Chest.

ST. PETER'S HOSPITAL FOR STONE, Henrietta-street, W.C.
WEDNESDAY, Feb. 1st.—3 P.M., Mr. R. Ogier Ward: Elucidation of Urinary Symptoms: Frequency of Micturition.

LONDON JEWISH HOSPITAL, Stepney Green, E.
THURSDAY, Feb. 2nd.—4 P.M., Dr. L. Mandel: Lecture-demonstration.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, Feb. 1st.—4 P.M., Dr. C. E. Lakin: Demonstration of Medical Cases.

ROYAL INSTITUTE OF PUBLIC HEALTH, Queen-square, W.C.
WEDNESDAY, Feb. 1st.—4.30 P.M., Dr. C. W. Buckley: Economics of Rheumatism.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY Feb. 2nd.—9 P.M., Mr. V. F. Hall: Modern Anæsthesia.

ST. MARY'S HOSPITALS, Manchester.
FRIDAY, Feb. 3rd.—4.15 P.M. (at the Whitworth-street West Hospital), Dr. Fletcher Shaw and Dr. Bride: Antenatal Demonstrations.

GLASGOW POST-GRADUATE LECTURES.
TUESDAY, Jan. 31st.—3.30 P.M. (in the Faculty Hall, St. Vincent-street), Prof. J. Hendry: Maternal Mortality Investigations.
WEDNESDAY, Feb. 1st.—4.15 P.M. (at the Royal Hospital for Sick Children), Mr. M. White: Surgical Cases.

Appointments

DONE, JANET M., M.B. Lond., has been appointed Resident M.O. to Horton General Hospital, Banbury.
FISON, J., M.D. Camb., Ophthalmic Specialist Medical Referee, under the Workmen's Compensation Act, for the Pontefract, Tadcaster, York, Ripon, and Harrogate County Court Districts (Circuit No. 15).
MITCHELL, A. P., M.D., Ch.M., F.R.C.S. Edin., Medical Referee, under the Workmen's Compensation Act, for the Sheriffdom of the Lothians and Peebles.
London County Council.—Senior assistant medical officers (Grade II.): L. HOUGHTON, M.R.C.S., Colindale Hospital; SMITH, D. R. E., M.R.C.S., St. Luke's Hospital, Lowestoft; and MITMAN, M., M.D. Lond., North Eastern Hospital. Assistant medical officers (Grade I.): WESSON, A. S., M.D., M.R.C.P. Lond., Archway Hospital; DOBBIN, C. J. V., M.R.C.S., Bethnal Green Hospital; FISH, R. H., M.R.C.P. Lond., High Wood Hospital; HARGREAVES, FLORA, M.B. Lond., F.R.C.S. Eng., Mile End Hospital; TANNER, N. C., M.B. Brist., F.R.C.S. Eng., Lambeth Hospital; and EVANS, R., M.B. Lond., Bethnal Green Hospital. Assistant medical officers (Grade II.): BROWNLEE, J. G., M.D., St. Mary Hospital, Islington; LYNCH, G. A. C., M.B. Liverp., Queen Mary's Hospital, Sidcup; RAWLINGS, W. J., M.B. Melb., St. George-in-the-East Hospital; CAPLAN, A., M.B. Lond., St. Pancras Hospital; and KAUFMANN, PHYLLIS I., M.B. Manch., F.R.C.S. Edin., St. Charles' Hospital. Clinical assistant: LYNTON-LOW, ETHELBERTA M., M.R.C.S., St. Giles' Hospital. House physicians: RENBOM, E. T., M.B., M.R.C.P. Lond., St. Olave's Hospital; and QUINN, T. R., M.B. Sydney, St. Leonard's Hospital.

Births, Marriages, and Deaths

BIRTHS

MONCRIEFF.—On Jan. 19th, to Honor (née Wedmore), wife of Alan Moncrieff, M.D., M.R.C.P.—the gift of a son.

MARRIAGES

BLAGG—THOMAS.—On Jan. 16th, at St. James's Church, Piccadilly, S.W., Arthur F. Blagg, M.D., of Heathfield, Chilworth, Hants, to Mrs. Florence T. Thomas, of Carlton Mansions, Clifton, Bristol.
LITTLE—GEORGE.—On Jan. 24th, 1933, at St. John's Presbyterian Church, Forest Hill, London, George Sinclair Ross Little, M.R.C.S., L.R.C.P., youngest son of the late Mr. David Little and Mrs. Little, of Cardiff, to Megan, eldest daughter of Mr. and Mrs. J. Evans George, of Forest Hill.
PATERSON—BAXTER.—On Jan. 23rd, at St. Columba's, Pont-street, S.W., Arthur Spencer Paterson, M.B., Swaylands, Penshurst, to Marie Antoinette Louise, daughter of the late Charles Baxter, W.S., and Mrs. Baxter, of Cheyne-walk, S.W.

DEATHS

BLAIR.—On Jan. 16th, at his brother's residence, Prestwich Mental Hospital, near Manchester, Matthew Cameron Blair, M.D., D.P.H., F.R.G.S., Honorary Consultant Nigerian Medical Staff (retired), and late Deputy Director, Sanitary Service, Nigeria.
COLBY.—On Jan. 20th, suddenly, Francis Edward Albert Colby, F.R.C.S.
GRANT.—On Jan. 16th, at Blackheath, after a long illness, Donald St. John Grant, I.M.S.
SARGENT.—On Jan. 22nd, from pneumonia following influenza, Sir Percy Sargent, C.M.G., D.S.O., F.R.C.S., of Harley-street, London.
THOMPSON.—On Jan. 20th, suddenly, at East Sheen, Edward Charles Thompson, F.R.C.S.I., D.L.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

NURSING EDUCATION IN MANY COUNTRIES

THE series of volumes on "Methods and Problems of Medical Education" which have been published at intervals since 1924 by the Rockefeller Foundation have been brought to a close for the time being. The fact that the final volume is devoted to nursing education and schools of nursing is of real importance, since it implies recognition of the development of nursing as closely bound up with medical education. The contents of the volume include 17 articles on methods of training nurses in different parts of the world, and the picture presented is a little one-sided, since as many as 10 of the 17 articles relate to nursing schools in the United States or Canada; but it is not less interesting on that account, since the aims of nursing education in America evidently differ considerably from those in the old world. The point which will immediately strike the medical reader is the academic trend of nursing education in America. Five university schools of nursing are described, at which it is customary for students to take the degree either of bachelor or master of science in nursing; such university courses are not for the rank and file, but are designed to train potential leaders—a sort of educational grading.

In an article on the Cook County School of Nursing, Chicago, Miss Laura R. Logan, the Dean, states that nursing education in America as a whole is "bound to the tradition of a hospital school, created only or largely to give service to that hospital"; but no account of such hospital schools of nursing is included in this volume, and it seems clear that leaders of nursing education in America believe the advancement of their profession to be closely linked with the development of university schools. Miss Annie W. Goodrich, Dean of Yale University School of Nursing, writes: "The importance of university relationship cannot be over-emphasised, for it has made possible within a comparatively few years an evolution of the program of nursing education that could be realised only through the freedom for study, experimentation, and demonstration that such a relationship permits." Much that such a programme entails would fall outside the scope of nursing education, as understood in this country. At Cook County School of Nursing, for example, the curriculum of the first year student includes the study of chemistry, bacteriology, pharmacology, drugs, and solutions, and during the second year courses of lectures on psychology, sociology, and economics are attended. The view of a group of medical men, quoted in another article, that the nursing profession is trying to make half-baked doctors out of nurses is set down as an attempt on the part of the medical profession to protect its own interests. It appears, however, that this doubt has assailed one of the leaders of the American nursing profession; Miss Shirley C. Titus, Dean of Vanderbilt University School of Nursing, writes: "There seems to be a tendency to forget the fact that the real function of the nurse is the act of nursing the patient. It would seem that in the American hospital the nursing function has been made a minor function, and the service demands of hospital groups, other than the patient, have been made the nurse's major responsibility." She attributes this misdirection of the nurse's energies to lack of sufficient nursing personnel in hospitals where the director has economised by cutting down the nursing staff, but it seems possible that the clinical side of nursing has also been pushed into the background in a curriculum overweighted with scientific theory. It is repeatedly stated by the writers of these American articles that throughout training the nurse is impressed with the relation of her work to the health of the community at large, and in this respect there is no doubt that the American nurse receives a sounder education than nurses in the old world. The public health aspect of nursing is regarded, in this country at all events, as a separate study, and the young nurse in training is not given a very vivid conception of her relation to the welfare and health of society as a whole.

The article by Miss Heaton on nursing in England included in this volume provides a good if necessarily condensed account of present conditions of nursing education in this country. Her survey includes an account of the syllabus for and conduct of the examinations leading up to State registration; of the preliminary training schools which some 60–70 hospitals have now established; of the supplementary parts of the State register; of the training of tuberculosis nurses; of post-graduate courses available for nurses; of hospital finance, and present-day tendencies in nursing. Her statement in a brief section on hours of work that it is customary to allow 45 minutes to nurses in training for midday dinner is unfortunately not true. Replies to the questionnaire issued by THE LANCET Commission on Nursing showed that in two-thirds of the hospitals only half an hour was allowed for this meal; and the recommendation of the Commission that this time should be extended to at least 40 minutes was evidently offered as the maximum time which would be likely to be conceded by hospitals throughout the country.

The training of nurses is evidently in a transitional stage in all countries; but it is safe to prophesy that where it is inspired by academic ideals to the neglect of clinical experience it will not provide the complementary service which medicine demands.

AN EMPIRE PROBLEM

THE material betterment of the conditions of native races is the aim which inspired Prof. Blacklock to write an essay on the house and village in the tropics.[1] He is anxious to create and maintain public interest in the development of the tropics, and suggests that an annual exhibition in London, where the existing village defects of various tropical countries could be fully demonstrated on the model of the Ideal Home Exhibition, would be a useful method of propaganda. In this book he does not deal only with housing, but discusses the growth of tropical medicine, the staffing of hospitals and medical services in the tropics, and the relation of tropical medicine to trade.

A section is devoted to a consideration of the native house and its attendant parasites, the jigger, the flea, the Tumbu fly, the Congo floor maggot, and various species of tick and bed-bug. The parasites which infest the roof (rats, ants, and other insects) are also considered, and the water-supply, which may convey cholera, typhoid, both forms of dysentery, ankylostomiasis, bilharziasis, or the Guinea worm.

This useful little work closes with a popular account of malaria, elephantiasis, sleeping sickness, and other filarial diseases. An entertaining chapter concerns the skin of the native child who, from the hour of its birth upwards, is subjected to a perpetual series of injuries and pin-pricks of every kind; this is an aspect of medicine to which too little attention has so far been paid. It would be interesting to pursue this study on psychological lines; such questions as the effect of the darkness of the tropical village, and of the impossibility of obtaining mental relaxation during the long hours of the night, are worth consideration. It is small wonder that the African often becomes a prey to the native magician. Those who intend to live in tropical Africa will do well to read this book, and even old-established residents there will find in it a fresh point of view.

[1] An Empire Problem: The House and Village in the Tropics. By D. B. Blacklock, M.D., Professor of Parasitology, Liverpool School of Tropical Medicine, the University of Liverpool. The University Press of Liverpool. London: Hodder and Stoughton, Ltd. 1932. Pp. 100. 3s. 6d.

THE JAMES MACKENZIE INSTITUTE

THE James Mackenzie Institute at St. Andrews was founded in 1919, but it is early yet to look for great results from work of the kind it is doing. The annual report comes as a reminder of the value of the records it is gathering, but on the cover is a warning that the income has diminished during the past year, and unless an annual increase of £750 is assured the governors feel that they will have to consider closure. Sir James Mackenzie chose St. Andrews as the site of the institute because he thought that its static population made it especially suitable for the plan he had in mind. The collection and arrangement of records of children forms the most important side of the work and, with the coöperation of the town's child welfare centre, this department has now succeeded in recording the health histories of about 90 per cent. of the babies of St. Andrews. They have now, however, collected sufficient material for the purposes of the Medical Research Council, which has therefore been obliged to withdraw the grant it has hitherto given to the institute. The whole of this material, which is considered unique as a health history of the pre-school child, has been at the suggestion of the late Dr. J. Parlane Kinloch, chief medical officer of the Department of Health for Scotland, submitted to Dr. Peter McKinlay, statistician of the department. The compilation of the health histories of a substantial proportion of the citizens of the town continues to progress with consequent benefit both to the institute and to the burghers. Other lines of research last year were on sugar consumption in relation to disease; the mechanism of the production of sensation; and the ability of the healthy kidney to excrete bacteria circulating in the blood stream.

MIMETIC MAGIC AND THE "YO-YO"

THE doctrine of signatures is the teaching that the colour or form of a plant, in whole or part, may cure disease whose characteristics resemble in one way or another those colours or forms. It lost its appeal when experiment and logic took the place of credulity. The view that like is cured by like, however, still retains its force, and a curious illustration of this is recorded by the Beirut correspondent of the *Times*. It would seem that an unusual spell of drought and cold has been disastrous to cattle in Syria, and the Moslem religious leaders of Damascus have attributed the untoward conditions to the wrath of Heaven in consequence of the introduction of the toy named "Yo-Yo" which gained universal popularity recently. The toy or contraption, whose vogue is now, we think, exhausted, was a sort of bobbin or spool of wood which is made to rise and fall by manipulating a string wound round the spindle of the bobbin. The Moslem priests maintained that "while people were praying for rain to come down from above the Yo-Yo goes down, and before reaching the ground up it springs again." Hence, of course, the drought, the rain, in mimicry, going up again before it has come down. In consequence of the protest by the priests the Minister of the Syrian Republic has prohibited the game, and the police have confiscated all "Yo-Yo's" seen in the streets. The sequel has been that during the Moslem week and on the sacred day of that week in central Iraq, where the drought had been most severe, rain fell heavily, and the accuracy of the religious divination has been proved to the Syrians.

Vacancies

For further information refer to the advertisement columns

Archway Hospital, Archway-road, Highgate, N.—Asst. M.O. £250.

Birmingham, Canwell Hall Babies' Hospital.—Res. M.O. At rate of £250.

Birmingham, Queen's Hospital.—H.S. to Ear, Nose and Throat Dept. At rate of £70.

Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.

Blackburn Royal Infirmary.—Res. H.P. £175. Also Fourth H.S. £150.

Bolingbroke Hospital, Wandsworth Common, S.W.—Asst. Gynæcologist.

Bradford Children's Hospital.—H.S. £100.

Bristol General Hospital.—Hon. Asst. Phys.

Bristol Royal Infirmary.—H.P.'s and H.S.'s to Special Depts. Each at rate of £60.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Third Asst. for Out-patient Dept.

Charing Cross Hospital, W.C.—Asst. Surgeon. Also Res. M.O. £350.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100. Also Registrar.

Coventry, Coventry and Warwickshire Hospital.—H.S. to Aural and Ophthalmic Depts. At rate of £125.

Croydon County Borough.—Asst. M.O.H. for Obstetrics. £750.

Croydon General Hospital.—Cas. H.S. £125.

East Ham Memorial Hospital, Shrewsbury-road, E.—Hon. Surg. to Ear, Nose and Throat Dept., Res. M.O. At rate of £200.

Fulham Hospital, St. Dunstan's-road, Hammersmith.—Asst. M.O. £250.

Glasgow, Lightburn Joint Hospital, Shettlestone.—Res. Physician. £375.

Glasgow University.—Harry Stewart Hutchison Prize. £50.

Gloucester County and City Mental Hospitals.—Jun. Asst. M.O. £350.

Halifax, St. Luke's Hospital.—Consulting Physician.

Hastings, Royal East Sussex Hospital.—Sen. and Jun. H.S.'s. At rate of £200 and £150 respectively.

Hertford County Hospital.—H.P. At rate of £150.

Highgate Hospital, Dartmouth Park Hill, N.—Asst. M.O. £250.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. Physician.

Hull Royal Infirmary.—Third H.S. At rate of £150.

Leeds General Infirmary.—Hon. Ophth. Surgeon.

Leicester Royal Infirmary.—Hon. Asst. Radiologist. Also Hon. Asst. Surg.

Liverpool, Alder Hey Hospital.—Two Res. Asst. M.O.'s. Each £200. Also Res. Asst. M.O. for Smithdown-road Hospital. £200.

London Hospital, E.—Med. First Asst. and Reg. £300.

London Lock Hospital, 91, Dean-street, W.C.—Surg. Reg. £100.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester, County Mental Hospital, Prestwich.—Asst. M.O. £500.

Manchester, Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Sen. and Jun. H.S. £130 and £100 respectively.

Müller General Hospital, Greenwich-road, S.E.—Hon. Asst. Physician.

Newark General Hospital.—Res. H.S. £175.

Newcastle-on-Tyne, Wooley Sanatorium, near Hexham.—Jun. Asst. M.O. £250.

New End Hospital, Hampstead, N.W.—Asst. M.O. £250.

Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. Also H.S. to Special Depts. Each £120.

Norwood Children's Hospital, S.E.—Asst. M.O. £250.

Paddington Green Children's Hospital, W.—Hon. Surgeon to Ear, Nose and Throat Dept.

Prison Medical Service.—Med. Officer. £446 14*s.*

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist. At rate of £100.

Queen Mary's Hospital for the East End, E.—Surg. and Dental Anæsthetist. 50 gns. and £25 respectively.

Rochester, St. Bartholomew's Hospital.—H.P. At rate of £175.

Rotherham Hospital.—Cas. H.S. £150.

Royal Free Hospital, Gray's Inn-road, W.C.—Chief Clin. Asst. for Ophthalmology Dept.

Royal Naval Medical Service.—Medical Officer.

Royal Surgical Aid Society, Salisbury-square, E.C.—Hon. Ophth. Surg. 50 guineas.

St. Bartholomew's Hospital, E.C.—Asst. Surgeon.

St. Benedict's Hospital, Church-lane, Tooting, S.W.—Asst. M.O. £250.

St. George-in-the-East Hospital, Raine-street, Wapping, E.—Asst. M.O. £250.

St. Luke's Hospital, Sydney-street, S.W.—Asst. M.O. £250.

St. Mary's Hospital for Women and Children, Plaistow, E.—Hon. Ophthalmic Surgeon.

St. Paul's Hospital for Diseases of the Genito-urinary Organs and Skin, Endell-street, Holborn, W.C.—H.S. At rate of £150.

St. Thomas's Hospital.—Res. Asst. Physician.

Salisbury General Infirmary.—Two H.S.'s and H.P. Each at rate of £150.

Southampton Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £150.

Southend-on-Sea General Hospital.—Res. Obstet. House Officer.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—Asst. H.P. £125.

Sudan Medical Service.—Two M.O.'s. Each £E720.

Swansea County Borough.—Asst. M.O. £500.

Walsall General Hospital.—H.S. At rate of £150.

West London Hospital, Hammersmith-road, W.—Asst. Phys. for Diseases of Children. Also Asst. Gynæcologist.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Caldicot (Mon.), Fleet (Hants), Romsey (Hants), and at Banff (Banff).

The Home Secretary gives notice of vacancies for Referees at each of the following Sheriff Court Districts or groups of Districts: Campbeltown; Dunoon; Kirkcudbright; Cupar; Glasgow, Lanark, Hamilton, and Airdrie; Dingwall, Tain, Cromarty; and Duns. Also for Ophthalmic Cases at Ayr, Kilmarnock; Glasgow, Lanark, Hamilton, and Airdrie; Paisley, Greenock, and Rothesay; and Stirling, Falkirk, Dumbarton, and Alloa. Applications should reach the Private Secretary, Scottish Office, Whitehall, London, not later than Feb. 11th.